Oil & Gas Middle East takes an in-depth look at the Big Data market, as the amount of data being generated by upstream operators is proving to be beyond manual management.
There’s something Big in the works

Big Data is making big promises to not just the oil and gas sector, by helping it manage its mammoth data and optimise operations, but also proving to be a boon for ICT companies

Regional NOCs and oilfield services companies alike are thus resorting to Big Data to not just manage and channelise to good use the tremendous volume of data it is producing each moment, but also sees this IT concept as a means to achieve operational excellence in this subdued oil price era.

The numbers are jaw-dropping: according a recent survey conducted by Cisco, oil and gas industry professionals believe that the concept of Internet of Everything (IoE) has the potential to automate 25%-50% of manual processes. As per the latest research report by Global Market Insights Inc, the global oil and gas analytics market size is expected to exceed $21 billion by 2024. According to a Micro Market Monitor report, the Middle East Big Data, business intelligence, and analytics market size is projected to grow from $5.09 billion in 2015 to $12.38 billion by 2020, at a CAGR of 19.4% from 2015 to 2020.

According to Cisco Consulting Services, by transforming business processes through IoE, oil and gas companies globally can capture their share of $600 billion of Value at Stake between 2016 and 2025. For a $50 billion oil and gas firm, this translates into an 11% bottom-line (EBIT) improvement.

However, it might be interesting to note that while Big Data and analytics may be new to some industries, the oil and gas industry has long been dealing with mammoth quantities of data to make technical decisions. In their quest to learn what lies below the surface and how to draw it out, energy companies have, for many years, invested in seismic software, visualisation tools and other digital technologies.

Now, the rise of pervasive computing devices — affordable sensors that collect and transmit data — as well as new analytic tools and advanced storage capabilities are opening more possibilities every year. For example, they can pair real-time downhole drilling data with production data of nearby wells to help adapt their drilling strategy.

Oil and gas companies essentially need Big Data to monitor operations, streamline processes, lower risks to workers and prevent disasters. These companies are deluged with data generated by a multitude of sensors and machines spread throughout their far-flung value chain. Internet of Things solutions are important for the oil and gas industry in that it allows oil and gas companies to manage and gather data from operations in remote environments while eliminating the need for workers in these environments.

SEIZE THE SPECIAL REPORT PLATFORM

When we at ITP Media Group launched the Special Reports initiative last year, the prime idea behind it was a realisation that industry players at times need something beyond advertisements to showcase and promote their work, products/technologies or achievements. An artwork in a magazine may not necessarily detail the tremendous effort that a company has put to develop a certain innovative product or an efficient technology that has brought great benefits to a client’s project.

Special Reports – which we fondly describe as a ‘magazine within a magazine’ – thus are a platform for you to collaborate with Oil & Gas Middle East to reach out to every corner of the wider industry you have been wanting to reach for so long. It is an opportunity that will provide that invaluable editorial highlight to your company’s sterling work – something it genuinely deserves.

By entering into a commercial arrangement with us to become a Knowledge Partner, you choose to have your company exalted to great heights before the regional industry. During the course of the year, we will be producing a number of Special Reports about key topics – subjects that will resonate with key issues within the industry (and even beyond) – and I hope there will be a Report relevant to and concerning every company.

Next month for the February edition, the Special Report is going to be on Pipeline Management. In this Report Oil & Gas Middle East will shed light on how crucial pipeline management is for regional upstream operators and how service providers are helping their clientele maintain pipeline integrity through various technologies.

We invite you to be a part of this campaign and seize the opportunity to reach out to our ever growing readership.
Regional Big Data growing in magnitude

According to a report published in 2016, the Big Data, Business Intelligence and Analytics market in the Middle East is expected to grow from $5.09bn in 2015 to $12.38bn by 2020, at a CAGR of 19.4%

WORDS: INDIRAJ SEN

The low oil price period and the resulting investment reductions and cuts have developed a focus on improving the efficiency of existing facilities to enable operators and EPC contractors to stay competitive. It is becoming evident that a major focus for everyone involved must be the minimisation of overheads and having an even sharper focus on productivity.

Less CAPEX investment on projects also means that the existing assets need to be operated for longer, or their production capacity needs to be increased. This results in more changes during the asset life cycle and requires more velocity for processing Big Data.

One approach to increasing efficiency and velocity can be through the use of better technology in conjunction with a clear plant information management strategy to be able to manage the virtual representation of the physical facility.

According to a 2016 report by Research and Markets, the Big Data, Business Intelligence and Analytics market in the Middle East is expected to grow from $5.09 billion in 2015 to $12.38 billion by 2020, at a CAGR of 19.4%. "The oil and gas market is one of the huge demand drivers for big data and analytics," Benoit Dubarle, president - Gulf countries and Pakistan, at Schneider Electric, says.

At the same time, increased attention should be paid on the value of asset information. The way data is being used can also have a major impact on the feasibility of developing assets viably. Oil and gas companies can benefit not only from deploying these types of new digital plant technologies such as enhancing safety procedures, or automating manual and paper-based processes, but also from integrating new and existing technologies.

Integrating virtual asset data with real time data to bring more reactivity during asset operation is another opportunity in the Big Data domain.

Independent market researches, including ARC Advisory Group, published a study about the need for developing an Asset Information Management Strategy in 2010. Their findings showed that not managing asset information properly can result in an annual loss of 1.5% of the annual sales of an asset per year.

Today, according to ARC Advisory Group, the global process industry loses $30bn annually due to unplanned downtime. "Worse: most – more than 60% – of plant failures are not even detectable by current preventive age and wear based maintenance practices (Source: ARC, Proactive Asset Management with IoT and Analytics, 2015)."

Luc Chantepy, regional sales vice president – MENA at AspenTech, says. "Most assets display a random failure pattern, and these symptom-based failures are only addressable via predictive and prescriptive analytic approaches."

"We see strong interest in addressing the previously unsolvable challenges of low asset availability, unplanned downtime and process disruptions. Companies will be forced to tackle these problems in an increasingly competitive global manufacturing environment with ever-changing supply and demand patterns that call for ever-higher levels of operational excellence," Chantepy continues.

"The industry will adopt a simpler, easier-to-deploy and -use, more accurate 21st century data-driven approach to improve plant reliability because traditional approaches to maintenance will not drive the performance improvements needed in the future."

Like other industries, oil and gas companies are continuing to invest in big data. This includes new data-management technologies (such as Hadoop), new solution architectures (such as data lakes and logical data warehouses) as well as new productivity platforms.

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THE ‘SMART’ WAY TO INTEGRATE OPERATIONS

The ‘SmartPlant Fusion’ engineering information management system developed by Intergraph Process, Power & Marine is helping EPC contractors and operators alike capture, organise, link and visualise data. François Haynes describes how.

INTERVIEW: INDRAJIT SEN

Give me an idea of your oil and gas clientele in the region and your scope of work with those companies.

Intergraph Process, Power & Marine has a strong global customer base including most of the big EPC and OO (Owner-Operator) companies worldwide, and we have performed a number of successful project implementations, including in the Middle East region with companies such as Saudi Aramco, Petroleum Development Oman, KNPC, ADNOC Group companies and Petrofac. ARC Advisory Group has ranked Intergraph PP&M as the No1 Overall World-wide Provider of Engineering Design Tools for the sector, and Intergraph Process, Power & Marine has a strong global customer base including those companies.

Elaborate on the work your company does in the Big Data domain, in particular reference to the oil and gas industry?

We want to give to our customers the capability to increase efficiency and velocity to process Big Data. One way will be to reduce the ratio of unstructured information. Accessing and navigating Big Data is another area where we want to provide value to our customers. Working with Big Data and sharing it independently of the physical by moving the Big Data into the Cloud is another key strategy we use to help our customers to create value.

Last but not least, we want to give our customers the capability to bring their Big Data on the field to increase operation and decision making efficiency. Indeed, mobile technology and augmented reality will make the Big Data light and easy to use on a day-to-day basis, driving operation efficiency on a level never seen before.

Could you talk about a specific product that your company might have developed in the Big Data space that would help or is helping oil and gas sector companies?

In the unstructured Big Data area, Intergraph SmartPlant Fusion, our engineering information management solution for capturing, organising, linking, and visualising data allows users to ‘unlock’ information from documents and drawings. SmartPlant Fusion also extracts information from 3D models, ViewText and other databases and lists as well as creates an interdisciplinary view portal to the plant information. Bringing all this information together allows to report on the quality of the information and to see if the data is consistent and complete. Regarding accessibility of Big Data, Intergraph SmartPlant Enterprise Portal will give the capability to navigate inside the information, from tags to documents or to 3D models, and to find the information quickly independent of the size of the big data.

By making Big Data ready for change, The SmartPlant Enterprise suite of solutions supports the whole plant life cycle. During which both EPCs and OOs can greatly benefit from managing their asset information. SmartPlant Enterprise enables an integrated project delivery through applying a rule-based philosophy that empowers both EPCs to comprehensively master their work processes within the system. It simultaneously enables powerful intelligent design, project customisation, and change management with integrated, out-of-the-box solutions.

For OOs, SmartPlant Enterprise offers templates based on unique and pre-configured owner operator work processes. Furthermore, it allows an integration with other leading third-party OO systems for maintenance, reliability, etc, and provides data exchange with contractors and suppliers, capturing unstructured information, validation, transformation, and loading of data exchanged to facilitate project execution throughout the project value chain.

Moving the Big Data into the Cloud will facilitate the following:
- Faster project start-up. A project environment can be up and running in weeks, rather than months.
- Improved collaboration. All project participants have easy access to relevant data, reducing rework between the project phase and handover.
- Smoother project handover. Every engineering company has its own system and standards, which are not necessarily compatible with that of the plant owner’s. This can cause immense issues at the handover stage and through operations and maintenance.

We can already bring Big Data on the field with the SmartPlant for Owner-Operators mobile solutions. These enable bringing documents and 3D models to the field, or help to support dedicated workflows, such as inspection or commissioning. Augmented reality is also knocking the door, demonstrating prototypes are already available and formal products will be released on the market in the coming months.

“WE WANT TO GIVE TO OUR CUSTOMERS THE CAPABILITY TO INCREASE EFFICIENCY AND VELOCITY TO PROCESS BIG DATA. ONE WAY WILL BE TO REDUCE THE RATIO OF UNSTRUCTURED INFORMATION, AS WELL AS ACCESSING AND NAVIGATING BIG DATA.”

COPING WITH THE ‘BIG’
CHANGES IN THE SECTOR

With more than 2.5 quintillion bytes of data produced from internet users per day, Big Data can help organisations make better informed business and technical decisions

WORDS: YASMIN HELAL

In today’s digitally driven enterprises, Big Data will be a huge benefit for the oil and gas industry, especially at a time of resource scarcity. Big data refers to the massive quantities of raw data generated by informational technology. In fact, according to technology company IBM, more than 2.5 quintillion bytes of data is produced from internet users in 24 hours alone. Decoding these using analytics software can help organisations make better business and technical decisions. For instance, in the oil and gas sector, the remote assistance in pipelines, prediction and mitigation of risks based on trend studies, and allocation of resources upstream and downstream, help oilfield operators become efficient. If leveraged and understood properly, Big Data holds the key to sustainability. Luc Chantepy, regional sales vice president, AspenTech, explains that “Big data enables better, faster decisions. With the ability to make better design decisions, reliability improvement decisions, capital spending decisions as well as quantify future operational scenarios, oil and gas companies worldwide are interested in how Big Data will help their assets break down less. Longer lasting assets and lower maintenance costs are attractive, but the main motivation is that the net production output of the process increases dramatically when plant reliability is improved.”

According to a Gartner 2016 survey, the investment focus is shifting from Big Data itself to building organisational capabilities to improve specific business areas and metrics. In this era of unstable oil and gas prices, energy firms in the region are more bullish about using Big Data analytics to provide full business visibility and to plan their long-term sustainable production. The business benefits are not theoretical. A recent report revealed that 56% of the region’s oil and gas projects are delayed and 70% are over budget.

Thus, it has become critical for energy firms to use data analytics for real-time insights that cut costs, enhance operations, and the supply chain. This is particularly true for digital oilfields, which can use Big Data analytics to allow for more mobile workforces as well as better prediction of trends such as new drilling locations, supply and demand, and predictive maintenance. Predicting events ahead of time allows firms to take proactive actions to avoid asset performance issues, increasing reliability and availability throughout the asset’s lifecycle.

The world of Big Data is changing. Businesses need to find effective ways to utilise the massive amounts of data being generated. The Internet of Things (IoT) is fuelling the digital transformation in the marketplace. Big Data is becoming increasingly pervasive across all industries, including the oil and gas sector, and data-driven companies are positioned to be successful disruptors.

“With the rise of the Internet of Things Era,” says Tayfun Topkoc, managing director, SAP UAE, “The Middle East’s digital oilfields can harness innovations such as drones, robotics, and 3D-printing to enhance their business models and competitiveness. However, energy firms should not deploy Big Data analytics in isolation. Instead, it is vital for it to be a part of a wider digital transformation strategy, which also includes robust cyber security measures.”

Mike Weston, vice president of Cisco Middle East, tells this magazine, “The ability to unlock hidden value within your data is vital to being competitive in today’s world. What you need is effective data management, data preparation, and analytics.”
SECURING BIG DATA

While Big Data has helped oil and gas operators optimise operations, it has also exposed systems to cyberattacks. Leo Simonovich, director of Global Cyber Strategy and Product Development at Siemens talks about why companies need to strengthen their cyber defence.

Could you give me an idea as to how important cybersecurity is to the oil and gas industry?

It is a top issue of the day. This wasn’t the case a few years ago, but the number of cyberattacks continues to grow – including both known and unknown attacks. And we know that operational technology has become a growing target, now comprising 30% of all cyberattacks. In this region, 50% of all cyberattacks are directed against the oil and gas industry. So it has a major impact on productivity, uptime, efficiency and safety.

What is your opinion of the recent Stuxnet virus attack on Aramco?

What I say to customers is that the probability of a cyberattack is almost 100%. The only question is what are they going to do about it. On an average, the oil and gas player experiences two to three major cyberattacks a year. Above all, we believe in holistic cybersecurity – the need to prevent and respond to attacks.

Siemens as a major industrial enterprise caters to a lot of segments – Big Data being a part of the offering. Does the onus also fall on you to combine that with cyber defence systems?

For Siemens, cybersecurity is a strong part of our vision for digitalisation and intelligent infrastructure. We recognise that using a risk-based approach to managing cybersecurity is important. Connectivity to be able to achieve operational excellence, which is a key part of digitalisation, is also important. But that connectivity also enables you to have situational awareness. And the lower the level you can go into the asset, or equipment, the greater transparency you will have, and the more precise you can be in employing countermeasures.

A flipside to digitalisation is also that it is making systems vulnerable to cyberattacks, as the one witnessed by Aramco recently. What is your opinion on this and how would you convince your client to adopt cybersecurity measures?

Yes, it is a key concern. Smarter infrastructure that takes advantage of software and the ‘Internet of Things’ can provide more points of entry for cyber attackers. I advise our customers to take a risk-based approach to build connectivity in blocks. Make sure you are connecting securely. We understand that at the top of the environment, it is not just about connecting two control centres, but also connecting those with pipelines and offshore facilities to be able to perform remote monitoring, automation and optimisation, securely. We have designed systems to address all of that. We call these systems ‘blueprints.’

At a time when the oil and gas industry is heavily cutting down on CAPEX, how would you convince your clients to adopt cyber defence measures?

If you look at the industry, one area where budgets have not stayed flat, or have even risen, is around cybersecurity. That means we don’t have to convince our customers that cybersecurity is an important issue they need to address. They already know this. They just need to understand what is mission critical.

Siemens’ Leo Simonovich.

“OPERATIONAL TECHNOLOGY HAS BECOME A GROWING TARGET, NOW COMPRISING 30% OF ALL CYBERATTACKS. IN THIS REGION, 50% OF ALL CYBERATTACKS ARE DIRECTED AGAINST THE OIL AND GAS INDUSTRY. SO IT HAS A MAJOR IMPACT ON PRODUCTIVITY.”