



# Insights, challenges and opportunities

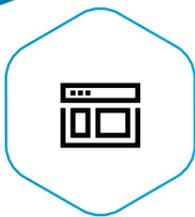
A guide to managing efficiencies and operations  
through IT in the Oil & Gas industry

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# Insights, challenges and opportunities - a guide to managing efficiencies and operations through IT in the Oil & Gas industry

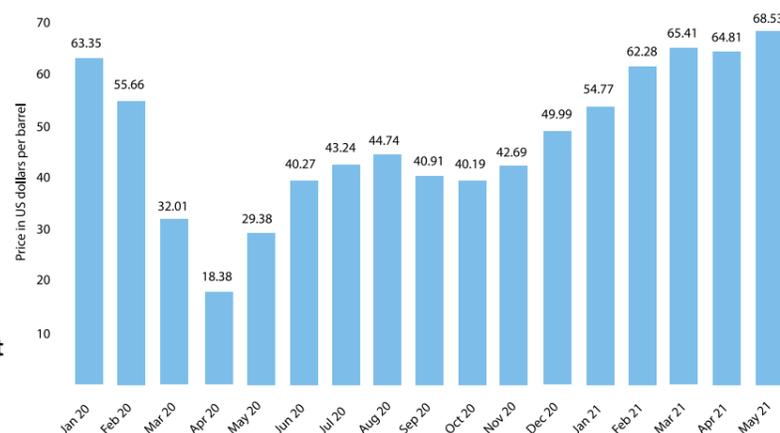
## Introduction

The COVID-19 global health crisis has heavily impacted oil and gas in both upstream and downstream markets. In April 2020, as the number of confirmed COVID-19 cases worldwide surpassed one million and the effects were felt in a myriad of ways, including travel, industrial slow-down and depressed demand for chemical and refined products, the average price of Brent Crude oil plummeted to 18.38 USD.

Although the average price of Brent Crude oil has since tripled, compared to the worst of the pandemic slump, the short to mid-term outlook still looks challenging for smaller operators and high-cost producers. It's time for innovation.

Fortunately, the oil and gas industry is no stranger to digital innovation; for decades, senior leaders have had to find the balance between creating efficiencies to appease the investor community, and investing in new technologies to meet the expectations of an increasingly eco-conscious world. In 2021, the impact of COVID-19 has ramped up the urgency of digital transformation and furthered the need to reduce cost and optimise efficiencies with new technologies.

This report summarises how innovation in IT and digital solutions can improve efficiency and mitigate risk in upstream operations. In particular, we examine five key insights that are shaping the future of oil and gas. Before then, we set the scene for some of the most recent impacts on the industry at large.



## Setting the scene

### Skills shortage

Experts claim that the oil and gas industry is on track for a major skills shortage. 50% of the oil and gas sector's engineers were eligible for retirement in 2015; now, that figure will be much higher. Furthermore, a recent survey from Broadbean Technology and job board OilandGasjobsearch.com revealed that 36% of oil and gas workers surveyed are looking to change career after COVID-19, with the main reason cited being that they considered the industry 'too unstable'. The next generation of workers, Gen Z, is also, on average, the most climate-conscious generation yet. The retirement of the 'baby boom' generation of professionals, and the need for organisations to prove that they are working to make operations more sustainable, are critical factors in making the sector attractive to Gen Z talent.

**50%** of the oil and gas sector's engineers were eligible for retirement in 2015

### Locations are becoming even more remote and challenging

With the depletion of large oil reserves comes the pressure to explore and operate in ever more remote and harsh locations, including the deep ocean and remote locations such as the Arctic.

In the first instance, the cost of drilling in Arctic environments are high, whilst investment is difficult to secure from a more climate conscious investor community. Meanwhile, environmental concerns around operations require careful management and may be limiting. Implementing necessary communications infrastructure and recruitment will become more challenging.

### Cyber threats

The industry's dependence on data insight, computing devices in daily work and increasing reliance on ever-more complex and linked systems also increases the risk of cyber threats and the potential cost of damage from attacks. Thales' latest cyberthreat report (February 2020) cites the energy industry as one of the most 'at-risk' sectors, hence the need for ever greater resilience strategies.



## Five technology insights that are driving efficiencies

It's important for senior leaders to understand how the opportunities provided by emerging technologies can overcome the challenges facing the industry, including the pressure to cut costs and skills shortages, in order to implement the most effective and affordable digital transformation strategies.

The following five technologies are driving efficiency and can play a major part in aiding sector recovery.



### Cloud computing

A company's c-suite must have full visibility of equipment performance, operational efficiency, health and safety and carbon output, in order to make timely decisions.

Cloud infrastructure helps provide this visibility and was built to improve teamwork and collaboration, as it enables an entire workforce across an organisation to access and share data quickly and securely regardless of location or device. Additionally, it allows for parallel collaboration, enabling both key decision makers and operators to cooperate with each other at the same level without the need for hierarchy communication.

Ensuring organisation-wide connection, from the boardroom to the drill floor, including homeworking for more distributed workforces, is as critical to upscaling operations as capitalising on the advantages of oilfield technologies.

Cloud infrastructure is more secure and flexible than legacy IT systems, is integrated for simplicity and unlocks creativity. Being device agnostic, it supports agility, efficiency and can mitigate risks from the most pernicious cyber threats, such as ransomware.

While many businesses already deploy hybrid cloud systems, such as Microsoft 365 and other Software as a Service (SaaS) solutions, oil and gas companies should consider Infrastructure as a Service (IaaS), which provides infrastructure components (hitherto physical assets) over the cloud, including servers, storage, networking and security for a fully streamlined system that offers full transparency. Microsoft's cloud solution, Azure, is the most widely recognised IaaS system.

Additionally, as an internet-led solution, cloud developments are paving the way for the oil and gas industry to benefit further from wearables, robotics and drones. With the emergence of 5G connectivity and satellite broadband, it's possible for real-time video

streaming through robotics back to the ops room or boardroom. But crucially, there now exists tools to enable end-to-end asset management and oil well data analytics and combine economic, production and operational data into one holistic platform to improve efficiencies and reduce cost. All of this contributes to far more accurate, instantaneous decision making.



### Big Data & AI

Oil has been referred to as 'black gold' in the past; now data is 'the new oil', the most valuable asset in the new world. Exploration and operations generate a wealth of unstructured data, collected through a plethora of linked sensors and software. While this data is critical in itself for decision making and risk-mitigation, monitoring equipment performance and fault discovery could be even more beneficial to senior leaders.

Too much information can be just as paralyzing as not enough. Therefore, leveraging AI analytics to process large streams of data, and filtering the right information, can further assist with proactive and timely decision-making in the boardroom.

Oil and gas companies are increasingly using AI to understand the oil well parameters and to solve

potential problems and aid production forecasting – allowing all personnel from engineer to CEO – to make faster, more informed decisions.



### 3D modelling and visualisation

The three main benefits of 3D modelling in oil and gas operations are greater accuracy, the opportunity for senior leaders to be informed of issues and take proactive action to mitigate risks and, as virtual copies of the platform (digital twins) allow for testing 'what if' scenarios, companies have the opportunity to discover the likely impact of changes and spend less time on planning.

Oil and gas companies have quickly realised the benefit offered by digital twins, which we predict will soon become ubiquitous across the industry.

3D modelling is also paving the way for organisations to predict performance and reserve estimates so as to maximise production output.



### Automation and robotics

The need for development of natural voice recognition for the oil and gas industry is steadily being acknowledged. While limited voice recognition technology has already been developed for consumer markets - the likes of Siri and Alexa, for example - development for industry settings, particularly industries as safety-critical as oil and gas, is far more challenging.

Natural voice recognition could offer the industry the opportunity to build automation capability into critical tasks, such as reporting on incidents, with a higher level of accuracy and speed. This capability could potentially be developed into both portable devices and wearables and augment the benefits of both.

Additionally, robots 'as a service' is beginning to take the industry by storm for its potential to vastly improve safety and efficiency. EXRobotics' First Responder robot (ExR-1), as an example, can be used for incidences where explosive gas may be present. The robot can be controlled from a safe distance to gather information required to assess any given situation, preventing the need for operators or emergency services to have to enter dangerous settings.



### IoT (Internet of Things) and IIoT (Industrial Internet of Things)

The oil and gas industry utilises IoT to optimise equipment, ensure safety, monitor remote areas and improve production. Valuable real-time data insight, which vastly enhances proactive decision making, is acquired by sensors. Although IoT is by no means new to the sector, it is still one of the main drivers of digital transformation and development of capabilities is ongoing. Combined with cloud infrastructure, IoT can transform operations. As an example, Zyfra, a Finnish start up, has developed a cloud based IIoT platform to enhance upstream oil and gas capabilities including predictive maintenance, precision drilling, production scheduling and artificial lift. Cloud based IIoT solutions can enable oil and gas companies to perform processes in real time, which can aid field operators to improve safety and efficiency.

Additionally, IoT is expanding the potential of using wearables in oil and gas operations. Like natural voice recognition, wearable technology is still an emergency technology in industrial markets.

Following oil and gas companies' efforts to digitally transform and ensure continuous communication by equipping field operators with portable devices such as smartphones and tablets, the next step is

to move to 'hands-free' devices which can further streamline communication and speed up tasks and help to reduce delays and potential safety issues, such as field operators having to remove gloves to use a smartphone.

Wearables, such as wristbands, smart helmets and smart glasses, can gather sensory and imagery data, serve as portable collection devices on the field, and transmit data back to the control room. These developments were made possible by the adoption of wireless connectivity and IoT in oil and gas and hold great potential to vastly improve visibility into operations and ensure safety.

All of these new and emerging technologies hinge critically on resilient WAN and LAN infrastructure being in place, which in the demanding and often extreme setting of the oil and gas industry is often easier to talk about than to achieve. Embedding ever greater degrees of IT system resilience and redundancy will become ever more vital to the health of the sector.





# Case Study



## CASE STUDY – Vysus Group

Grant Cooper, Head of Business Services with Vysus Group, said: *“As part of a larger transition programme, we had a very tight timescale in which to migrate our IT services from the LR domain to a new Vysus Group environment, with the added complexity of delivering this ambitious schedule remotely. The responsiveness and solutions-led approach conveyed by the ISN team meant that in partnership with our internal stakeholders, we were able to successfully achieve our targets with minimal disruption to business operations.”*

### **How ISN Solutions rolled out more than 600 remote users across 18 countries in 90 days – in a global pandemic**

ISN delivered the migration of a Microsoft modern workplace for Vysus Group’s 625 users, based across 18 countries, in only three months during the COVID-pandemic.

Vysus Group, a leading engineering and technical consultancy, specialising in asset performance, risk management and project management across energy assets, is the former Lloyd’s Register Energy Division. Following the transition of Lloyd’s Register Energy Division to Vysus Group, there was an urgent need to complete Vysus Group’s cloud to cloud migration as quickly as possible to enable the business to run as efficiently as possible. This needed to be completed with minimal disruption to time, costs and business

operations, in only twelve weeks, and completely remotely, to align with health and safety considerations during the lockdown.

We enabled Vysus Group’s employees to rebuild their laptops at home via Microsoft AutoPilot and Intune. Additionally, we deployed a cloud-to-cloud migration, and provisioned a new Azure environment with intelligent security features. The new environment provided the client with seamless cloud infrastructure, in which all key business applications, user accounts, and data from the Lloyd’s environment were moved over to the new system, and delivered Microsoft modern workplace (M365), ensuring security and compliance. Making the process remote created cost savings in both financial and time commitments for the customer, and vastly decreased the amount of potential disruption to the business.

Vysus Group chose to work with us because of our unique market position - an IT managed service provider, large enough to deliver critical projects requiring significant resource and specialist skills, but also flexible and willing to work closely with them as their needs evolved.



## Four reasons our clients come to us

### 1 Flexibility

We can provide what in-house IT teams perhaps cannot: flexibility and scalability to suit changing business need, delivering service and projects in parallel, rather than at the expense of each other.

The main benefits to outsourcing are the predictability and management of IT support costs, and access to the knowledge and expertise of a wider technical team. We can take the pressure off companies in times of crisis or economic disruption. Our flexible and personalised managed service model scales and grows with you.

### 2 Experience of extreme locations

We have a long and rich heritage in partnering with companies working in extreme and challenging environments across the globe, including E&P companies, and are experienced in delivering solutions with the additional rigour oil and gas operations require. For two decades, we have helped companies in the oil and gas industry to overcome mission critical challenges. These include advising on optimum connectivity solutions to implement robust and secure networks for upstream offshore rigs with very

little or no connectivity and implementing scalable IT infrastructure solutions to assist business expansion into new territories.

### 3 Market knowledge

Our senior leadership team has intimate knowledge of the oil and gas industry and its unique challenges. We know your world and have direct experience in providing solutions to industry-specific issues.

### 4 We free up senior leaders' time, so you can focus on growth

We only use the latest software and security solutions on the market, so senior leaders can be assured that their IT system is secure, proactively defending against cyber threats, is compliant and enables worker productivity. We take care of your IT so that you can get on with what's important, growing your business.

## Conclusion

The oil and gas industry must accelerate digital innovation to build resilience against threats on the horizon. The need for robust and resilient IT infrastructure is often the overlooked component in transformation strategies, but it shouldn't be.

IT infrastructure, like the IoT, often acts as the enabler of the advanced capabilities of new technologies. For senior leaders to be able to benefit from big data insight or the ease of collaboration through cloud infrastructure, as examples, a company's IT infrastructure must be robust, completely reliable and fit for purpose. Developments in information technology form the foundation of digital transformation efforts and are crucial to defend against cyber-attacks, which can threaten the very existence of a company and can have an impact on its leaders, people and customers.

For more than a decade, the industry has evolved to rely heavily on data insight. As large oil reserves continue to deplete, oil and gas companies may be forced to explore in ever more remote and harsh locations that are expected to have very little or no communications infrastructure. In this case, there will be a need for reliable connectivity and IT infrastructure that allows for flexibility and agility.

As the skills shortage becomes more apparent, oil and gas companies could benefit hugely from deploying robotics to fill the gap, and could also benefit from outsourcing IT to a service provider with experience supporting companies operating in remote environments.





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