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**THE DIGITAL
OIL COMPANY:
GETTING AHEAD
OF THE ENERGY
TRANSITION**

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THE ENERGY WORLD IS IN TRANSITION

Today's fast-moving digital environment is enabling many companies to boost efficiency. Very few are exploiting digital to its full potential.

The oil and gas sector was, in fact, a relatively early adopter of sensors, real-time monitoring equipment, automation and data analytics. It is now time to exploit them better as well as start investing in the New*.

A recent Accenture and World Economic Forum report indicates that the oil and gas sector has not taken advantage of many opportunities that derive from using data and technology in more meaningful ways.¹ Digital technologies have not yet been exploited to drive transformation in oil and gas.

Today, digital is a key enabler in the oil and gas industry to reduce costs, make faster and better decisions, and increase workforce productivity. For the vast majority of oil and gas companies, however, it remains difficult to translate digital efficiency into better financial performance and new business growth.

The sector is still going through testing times. Weaker oil prices, lower demand, delayed capital investment and widespread cost cutting continue to undermine profitability and shareholder value (although this is slowly improving). However, as the oil price has stabilised, the intention to invest and grow is returning to the industry, even if the focus and scale of this intention continues to be uneven. In fact, as a recent Accenture survey on the impact of digital in the refining sector shows, only 19 percent of companies are focusing on digital as an investment priority with new digital technologies actually still disrupting rather than supporting investment plans and priorities.²

The energy sector itself is also transforming. Climate change regulation is increasing in many countries and oil companies are starting to shift strategies and business models to be less dependent on fossil fuels.

Signs of adaptation can be seen, such as the creation of new clean energy and renewable power divisions by some oil majors and investments into cleaner energy transportation infrastructure.

It is against this backdrop that interest in digital technologies is increasing. Despite the intention to invest, absolute levels of investment will be constrained by the changing economics of the industry. This means oil companies must really understand and believe in the benefit of digital and start to invest more in the "New" to better manage this transition.

***Accenture is defining the context of the "New" as follows:**

Our clients' worlds are changing all the time. They are experiencing demographic shifts (millennial), changing customer expectations (the rise of the sharing economy), shifts in macro, social and cultural trends (climate change) and, of course, emerging technologies (digital, quantum computing, solar, etc.).

When these forces meet, they can cause major discontinuities and disruptions for businesses and societies—as well as enormous opportunities for organizations. As a result of the shifting environments, new business models emerge.

An organization's core business is joined by the nearby new business opportunity, which is driven by innovations in new management practices and new technologies. The new business allows companies to challenge conventional practices and serve customers better, faster and cheaper than the existing approaches provided by incumbent players.

UNLOCKING VALUE THROUGH DIGITAL INVESTMENTS

For the oil sector, digital is still not delivering where it truly counts—in improved financial performance. In contrast, disrupters* use digital to unlock value in core businesses, value chains, and new business models within and across sectors. They have the unparalleled ability to master the layer of complexity digital brings and leverage it to create value.

Digital can enable a refresh of core oil and gas businesses, sparking investments in, for example, new platforms, Internet-enabled solutions and “as-a-service” business models and interactions with consumers. In an interconnected energy system, consumers know more and expect more. They want products and services to be highly customized to address their needs and expectations. They desire personalized interactions and experiences.

The Accenture Digital Performance Index³ research assessed 343 leading global companies, including more than 40 oil and gas companies throughout the world. Our results indicate that the Digital Disrupters have a clear advantage over the energy companies in the sample (Figure 1).

The research rated digital investment and progress across dimensions: plan, make, sell and manage. Company performance at each was assessed across each of these four broad functions, underpinned by 42 activities and 117 metrics.

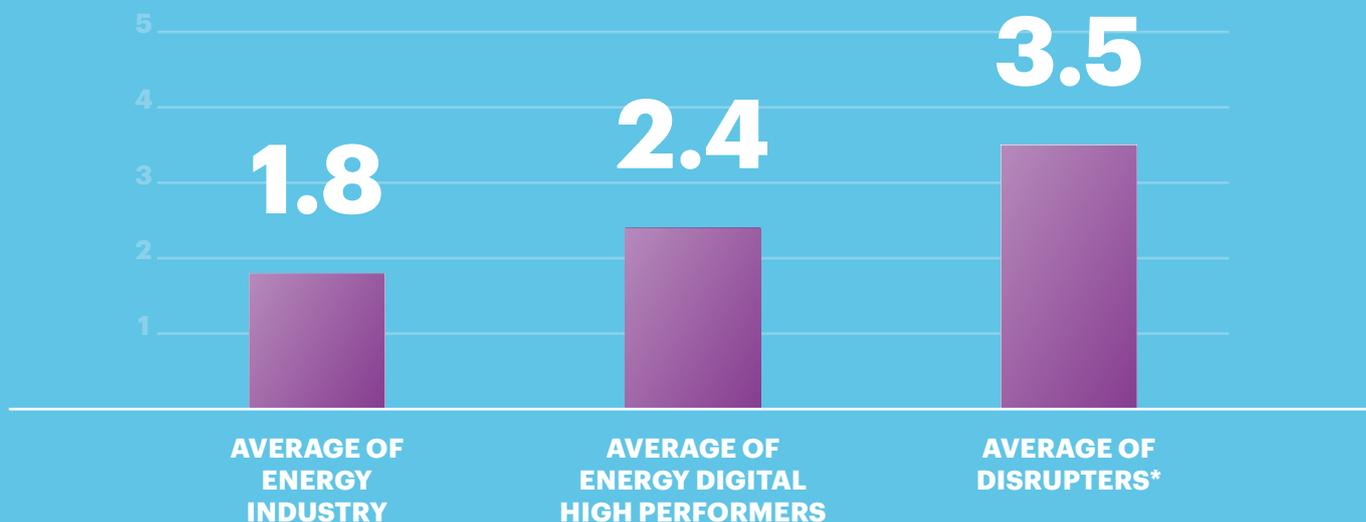
Overall, oil and gas companies scored well in the first two dimensions: planning and making. Integrated oil companies ranked higher in selling than did pure exploration and production, and oilfield service companies. This finding makes sense given the stronger downstream presence, and closer connections to wholesale and retail customers. All oil and gas companies were relatively weak in applying digital in the managing category.

Here is a more detailed look at how digital applies in each of the dimensions:

PLAN

The first dimension looks into how digital trends are reflected in strategic plans and implementation. For oil companies, this capability covers how a company thinks about the impact of digital on its multi-year strategic plan, how that plan breaks down in areas across the value chain, and how capital and workforce allocations are planned.

FIGURE 1. DIGITAL PERFORMANCE SCORE: ENERGY COMPANIES VS. DISRUPTERS*



*Disrupters include Silicon Valley technology companies.

MAKE

The second dimension assesses digital use in innovation, production and delivery. This dimension considers how the “digital thread” pulls across the entire value chain to create safer, more reliable and efficient operations. Some oil companies are focusing on the design and building of products and services based on digital technologies or innovative approaches. Others have embraced the concept of “open innovation” to fast-track innovation and reduce development costs. Most focus on a range of technologies—including analytics, cloud, big data and mobility—with increasing interest in digital for predictive purposes and artificial intelligence (AI).

SELL

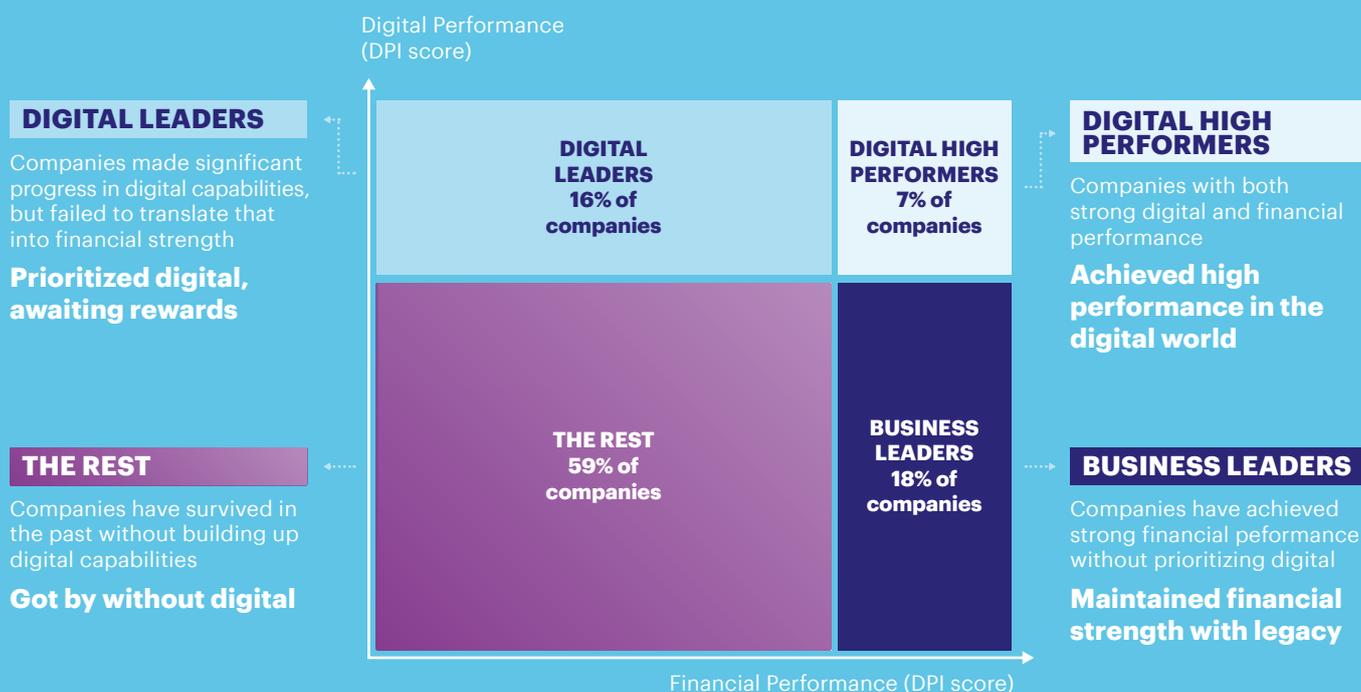
The third dimension evaluates management of the customer experience across digital channels. The oil and gas sector has less direct connection with consumers than do other sectors that depend on a deep understanding of customers. The balance of power in business generally is shifting toward consumers, who are demanding personalized services, convenience and seamless experiences. Some companies in oil and gas are, however, starting to make the shift to better serve consumers. They are offering new products, starting new services, and looking at better customer interactions focused on billing, payment and service inquiries. Digital can also update the wider retail station experience for today’s consumer.

MANAGE

The fourth dimension examines the presence of digital technology and mind-set in corporate culture and internal operations. It evaluates how companies assess their own digital culture and infrastructure, how they improve efficiency and how they renew their resources with the aid of digital. Under the current weak-price environment, oil and gas companies have accelerated ways to improve efficiencies and reduce costs. Taking the next step to create new business models is more challenging. Some oil companies are achieving maximum efficiencies from repetitive, standard processes, partly by automating more tasks, including basic engineering functions. Others are outsourcing more functions, which may include those that were traditionally considered core, such as well surveillance upstream. Complete convergence of information technology with operations technology (IT/OT) and the embedding of the digital into C-suite decisions, however, seem less likely in the near term.

The Accenture research indicates 7 percent of energy companies are digital high performers that is, they are using technology advances to drive financial performance (Figure 2).

FIGURE 2. CATEGORIZING THE PERFORMANCE OF OIL AND GAS COMPANIES



Digital success: company’s DPI score in top quartile in industry peer set

Financial success: company has an High Performance Business grading of B and above 44 energy companies analysed in total

DIGITAL DISRUPTERS— CHANGING THE RULES OF THE GAME

Within the past few years, digital disrupters or innovators have recognized the value of using asset-light and easily scalable business models. These companies have revolutionized every element of their respective industry’s traditional business model, including how they interact with customers, manage assets, and schedule, operate and price key services.

When looking at the average scores between the two across the four dimensions (Figure 3) a significant performance gap can be seen between companies that Accenture terms “Digital Disrupters” and those in the energy sector. The disrupters are generally found in high-tech industries, but also in retail and transportation. These sectors appear at the forefront of digital trends and are investing actively to turn their agenda into value and growth.

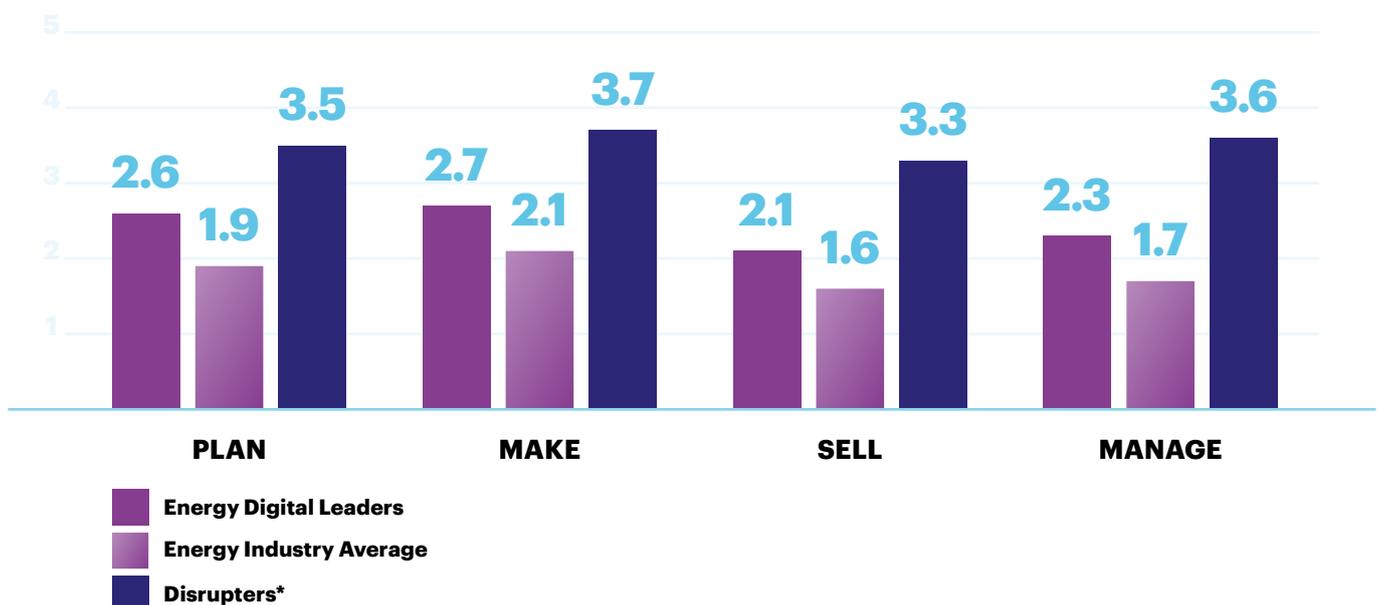
By boosting efficiency, digital advances could help oil companies surmount cost challenges—largely driven by lower oil prices—in the short to medium term. However, they could go further, tearing up traditional operating models, transforming customer

experiences, and finding value in the “new,” thereby securing alternative routes to revenue growth despite prevailing industry conditions.

Digital Disrupters focus on more than improved access to data, end-to-end process delivery and cost cutting. They create and adjust businesses around concepts such as customer convenience, collaboration, transparency, and connectivity that enable interaction and security. They are also getting the timing of these changes right; whether enhancing or advancing the core business, or creating new business, they excel at timing and scaling.

Comparing Digital Disrupters to asset-heavy oil and gas companies might seem unfair. However, it is relevant to consider how disruptive companies have successfully adopted new business models that are less asset-heavy. So as not to be caught off-guard, it is useful to consider how the oil and gas sector might also be disrupted and what they might do in response.

FIGURE 3. DIGITAL DISRUPTERS* EXCEL ACROSS FOUR DIMENSIONS



*Disrupters include Silicon Valley technology companies.



These companies have revolutionized every element of their respective industry's traditional business model, including how they interact with customers, manage assets, and schedule, operate and price key services.

OPPORTUNITIES FOR OIL AND GAS COMPANIES

ARTICULATE A CLEAR DIGITAL STRATEGY

Companies need to act decisively, identifying digital as a growth and value lever by proactively planning strategies and committing investment. Many oil companies and oilfield services players are undertaking transformation programs to drive efficiencies in core operations. Those who are embedding digital and technology as a strategy beyond efficiency are finding that digital can create synergies across business, reduce duplications of investment and open their business to new opportunities. More importantly, they avoid building the new with outdated thinking and technology. A good digital strategy sometimes will require changes in leadership or additional leadership skills; it most likely requires new skills and talent.

Many oil companies are undertaking digital transformation programs to drive efficiencies in core operations. Most are focusing on a range of digital technologies such as analytics, cloud, big data and mobility. Mobility, for example, has been successfully leveraged to automate processes allowing for effective management of tasks, such as invoicing from the field or plant, in journey management, and in the areas of health, safety and environment. On a larger scale, improved mobility can drive cost reduction by changing processes and systems to enhance the business delivery model.

Also, companies are finding that the digital technologies that offer the most potential for investment are the very ones where they have capability and skills gaps. Recent Accenture Research (Figure 4) into the value of digital technology to Asset Intensive Companies shows that digital technologies remain underexploited by most Asset Intensive Companies—the exception being those that have adopted fully integrated digital strategies. However, it is a challenge to develop and execute a strategy directly enabled by digital. It requires moving away from thinking less about markets, competition and value in the core business alone to focusing on agility, adaptability, innovation and better technology integration.

USE PLATFORMS AND INNOVATION TO DRIVE VALUE

New platform-based business models could drive the most profound global macroeconomic change since the Industrial Revolution. Companies are using the cloud, the Internet of Things (IoT), open-source and reusable software, and mobile development platforms—among others—to create value for themselves, and with their partners, communities and consumers.

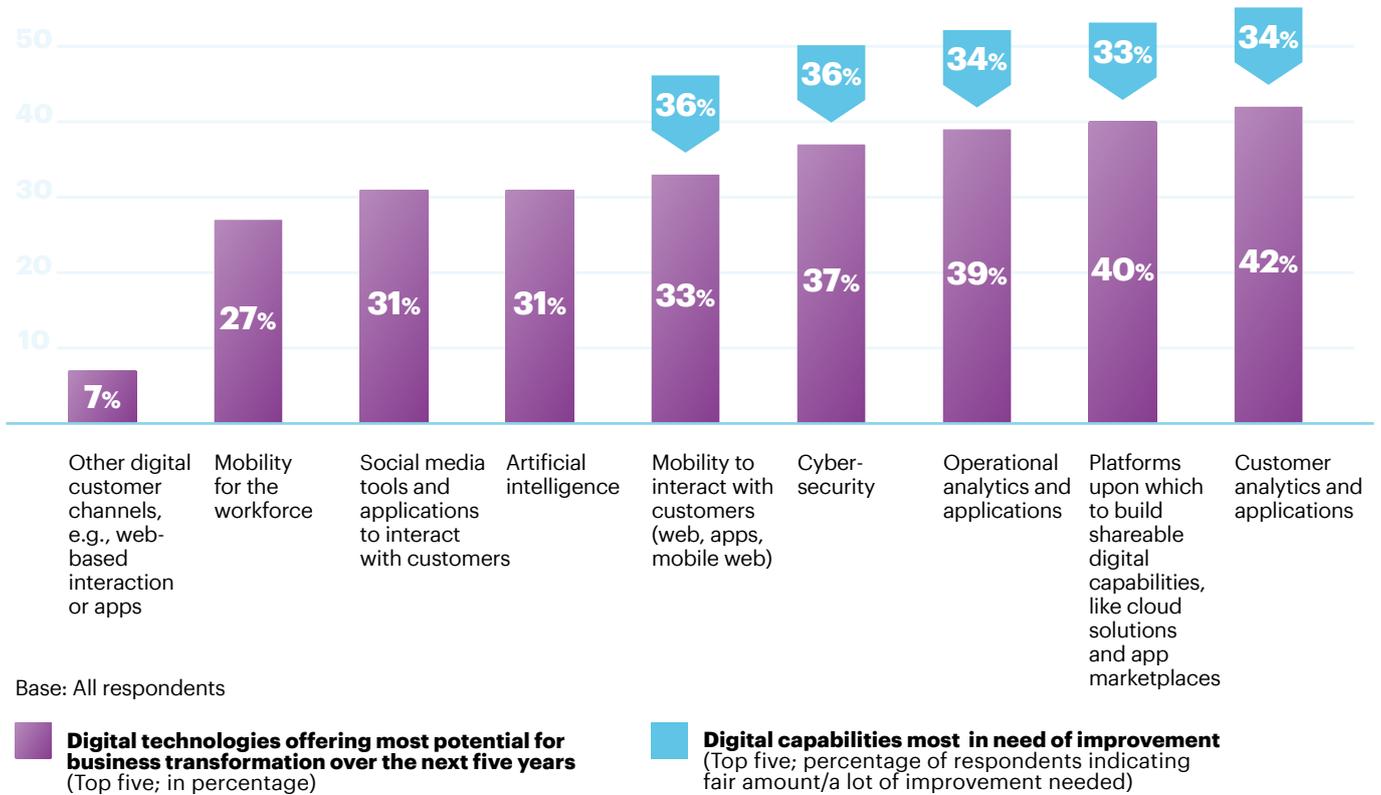
With oil prices flat and margins tight, it has become harder for oil companies to focus on growth and new business development. While oil companies are now investing again, levels of investment in R&D and innovation are unlikely to change substantially and are often disconnected from digital plans. New products and services built with digital technologies can benefit the business, particularly when they build directly on innovation, and research and development. High performers understand the need to expect similar value from software and analytics as they do from the core oil and gas business itself, and they invest appropriately to unlock that value.

Collecting, managing and driving value from data is now at the heart of the oil and gas industry, and digital platforms are key to that. Most oil companies are migrating IT infrastructure to the cloud and using mobility and the IoT to support decision making. But, for many, it is still challenging to integrate such technologies across the business and to collaborate to drive greater value.

Some oil companies are pursuing creative approaches, for example, crowd sourcing and open innovation to solve technical challenges faster and cost-effectively. Digital also needs methodical approaches for developing and/or industrializing new capabilities. This includes decisions about whether to build or buy capabilities, and a program management approach to scale up technology and digital platforms. In short, companies need to drive a culture of innovation and technology adoption—two speed OT, operations technology, and IT, information technology.

FIGURE 4. RESOURCE COMPANIES: MOST PROMISING DIGITAL TECHNOLOGIES

For Asset Intensive Companies*, the top five most promising digital technologies match the capabilities most in need of improvement



Asset Intensive Companies include companies from chemicals, oil and gas, metals and mining and utilities sectors
 Source: Accenture 2016 Resources CIO Survey.⁴

TRANSFORM THE CUSTOMER PROCESS

A shift in the balance of power is a challenge for any sector, the oil industry included. Industries everywhere are now dealing with a more customer centric world. These customers want personalized services and seamless experiences that enhance convenience, choice and price. The best digital performers are learning to focus on the customer experience across the wholesale and retail parts of the business, including integration with supply chain and procurement. Digital is also increasingly important in global supply chains, not only enabling companies to create more efficient processes, but also by tapping into an ecosystem of new markets and players.

The oil and gas industry is developing and using newer technologies such as robotic process automation (RPA), artificial intelligence (AI or machine learning) and virtual agents, all of which are likely to be future value levers. Many oil companies are now using machine learning in many assets and plants to increase efficiencies, reduce downtime and avoid costly shutdowns, for example, providing operators with quick access to hundreds of years of data and analytics rather than relying on the experiences of individual employees.

Virtual assistants are becoming increasingly common, primarily for customer service, with many now specializing in conversational speech to help search and provide support, and some can even learn to understand human emotions. AI will be used to boost efficiency in RPA, making operations more efficient by freeing workers for insight-driven analytics work.

ROTATE TO WIN BY TRANSFORMING THE BUSINESS MODEL

While investing in new digital assets, many companies are missing growth potential by not transforming core business models. As a result, oil and gas companies risk being overtaken by new competitors from inside and outside the industry.

Companies in other industries have faced margin pressures for many years and have adopted different business models leveraging digital, IT and outsourcing. As oil and gas companies look for new ways to improve effectiveness and reduce cost, the transformation of their operating models to one increasingly enabled by technology is crucial.

Examples might include narrowing the business scope to the most profitable assets; gaining efficiencies from repetitive, standardized designs and processes; increasing automation; outsourcing core functions; engaging in a more variable approach to cost (such as linking service contracts to wells and production instead of day rates); and using analytics to optimize day-to-day operations.

Many oil companies are gaining maximum efficiencies from repetitive, standard processes. Some of these gains have been achieved by automating more tasks, including basic engineering functions. Many are trying to create flexible workforces by sourcing skills not only from inside the company but also from outside, through crowdsourcing, open innovation, and more efficient use of freelancers and contractors.

Some are using networks to tap into newer skills such as data science, and are outsourcing functions traditionally considered core, such as well surveillance in the upstream. The use of analytics is also becoming more routine in oil and gas, whether it is to improve operational performance, or to use predictive analytics for optimized plant turnarounds and maintenance.

DIGITAL TRIUMPH IS ALSO ABOUT TIMING

Many new technologies and platforms are available for the oil and gas industry to exploit to move to the forefront of the digital industrial revolution. Today's focal areas are, for example, predictive analytics (to minimize asset downtime and improve operational efficiency), automation (to reduce labor costs), mobility (wearable technologies, sensors, robots and drones), or other technologies for advanced operations or innovation centers, or at retail sites. Tomorrow's focus must be on making a truly digital shift in an organization's business model to maximize new investment and establish a new path to growth.

The shift is not just a matter of the change itself, but also timing. Too soon and the risk is too much disruption; too late and a business can get left behind. Companies focused intently on delivering according to the existing rules of the game can miss

important shifts occurring in the ecosystem.

The changes can seem immaterial initially. However, these can escalate quickly to a point where it may become difficult to catch up with industry leaders.

The key question companies are asking themselves today is, "How can I manage my investment processes and my capital allocation over time in my core business and in my new business, and get the balance right?" Oil companies that are achieving this are using new digital technologies, like the cloud and analytics, and platform technologies coupled with nontraditional processes, such as open innovation, to boost the core business while creating value from newer investments. Examples can be found in renewable energy, where they might not have as much expertise or where they need to accelerate growth.

IT IS CRITICAL TO ROTATE TO THE NEW BY FOCUSING ON CONVERGING IT AND OPERATIONS TECHNOLOGY

There is no doubt digital is disrupting the landscape. The energy market is driving concerns about demand, the pace of technology development is altering consumer behaviors and many oil and gas incumbents are struggling with a successful transition.

What is clear is that oil and gas companies hold themselves to high performance standards with a renewed focus on safety and improvement. Digital is being viewed as the next wave that can result in a step change in safety efficiency, growth and value creation.

It might involve risks but many are now realizing that even asset-heavy oil and gas companies are not immune to the impact of digital disruption and need also to prepare themselves for the future while they still invest in their core business while releasing capital to innovate.

Digital also will allow oil and gas companies to be more agile and nimble and employ a more integrated operating model. Such a model redefines the value chain, where units of production are selected based not only on geological and engineering know-how but also on being able to rapidly adjust to cost and efficiency changes. Units of demand will be seen as reactions to real-time opportunities, based not only on growth aspirations but also informed by tailored customer engagements based on optimized services and solutions.

Most oil and gas companies today continue to invest in systems to handle huge volumes of data in fast, secure and flexible ways, and are harnessing the power of the cloud and mobility to create cost-effective, efficient and safer operating environments. Those who are leading the way in digital are devising strategies that enable the convergence of IT and digital innovations with operations technology.

Understanding how to “rotate to the new”—toward a new energy system and the technologies that enable it—is now crucial for the oil and gas sector. It is also important that digital transformation is supported by the vision of senior executive leadership who can unleash its value based on strategy and programs and not just proof of concepts. Developing a strategy which is digitally enabled is hard and risky, and changing an operating model to be more integrated with technology is even more challenging. Both offer an opportunity for oil companies to not only stay competitive but emerge as leaders in the future energy landscape.

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