



IT in the New Reality for Oil & Gas

2020 has been a tumultuous year for the oil and gas industry with (17 percent) in 'hard reset' mode – double that of the overall average (8 percent). Commodity prices, already significantly depressed, were exacerbated by disagreements between Saudi Arabia and Russia over production levels. And then COVID-19 struck. The pandemic dramatically reduced demand as commercial and consumer transport modes effectively went into hibernation and manufacturing output dropped. The effects were so drastic that on April 20, 2020, crude oil contracts went negative for the first time in history. Since then, OPEC+ compliance and the slow reopening of many countries around the world have propped up Brent crude prices, with prices recovering to pre-COVID levels late in the year. But in light of the volatility, the drastic downturn caused many oil and gas companies to reduce development programs, scale back production or shut down wells in order to reduce both capex and opex. Oil and gas executives have focused on cash preservation, concentrating on core operations. It's likely that we'll continue to see a number of impairments, bankruptcies and restructurings in the sector, and a longer-lasting impact beyond the immediate COVID-19 hits to cash and liquidity - effects that may permanently change the sector as we know it.

Alongside this, the industry is already grappling with growing pressure from climate change and ever louder demands from governments, stakeholders, NGOs and consumers for cleaner forms of energy. Investment into clean energy sources and infrastructure has become both a strategic imperative and an opportunity for financial revitalization.

Despite all this, for the foreseeable future the world will go on significantly relying on fossil fuels in the new reality. As supply chains start to revive, and travel and quarantine restrictions are lifted, demand will begin to rise again and buoy oil and gas prices. The super-majors and majors have sufficiently large balance sheets to withstand the short term pressures – although some smaller competitors and oilfield service providers will struggle to weather the storm.

From a technology perspective, everything must be geared around enabling efficiency and cost gains. Systems and data must be integrated across front, middle and back offices to deliver more precise forecasting, enable shorter decision cycles that drive profitability and reduce waste. Enterprise SaaS, advanced analytics, and automation must be fully utilized across both production systems and corporate platforms to modernize largely disparate and aging tech stacks. Insights across the enterprise will be needed to better collaborate with the business and supply chain partners as well as to identify strategic investments.

Board priorities & investment

Whilst amongst the leaders in the application of advanced technology to operations, in the IT function the oil and gas industry traditionally moves relatively slowly, so there is a critical need for companies in the sector to double down on innovation and speed. The traditional supply/demand model is now at a tipping point, helping unite the business and IT to push for greater value, efficiency and effectiveness - making it no surprise that Boards are chiefly looking to IT to address improving operational efficiency to minimize downtime and poor utilization of assets and gaining actionable insights from data. Infrastructure/cloud is the number one IT investment priority for Boards – indicating their appreciation of the key importance of digital infrastructure, cloud-based collaboration platforms, IIOT and intelligent operations in the sector.

Top three business issues that management boards are looking for the IT function to address:

Oil & Gas vs. overall

Oil & Gas

-  1. Improving operational efficiency
-  2. Gaining actionable insights from data
-  3. Enabling the workforce

Overall

-  1. Improving operational efficiency
-  2. Improving customer engagement
-  3. Enabling the workforce

Three most important technology investments:

Oil & Gas vs. overall

Oil & Gas

-  1. Infrastructure/Cloud
-  2. Security and privacy
-  3. Technology development, management and operations

Overall

-  1. Security and privacy
-  2. Customer experience and engagement
-  3. Infrastructure/Cloud

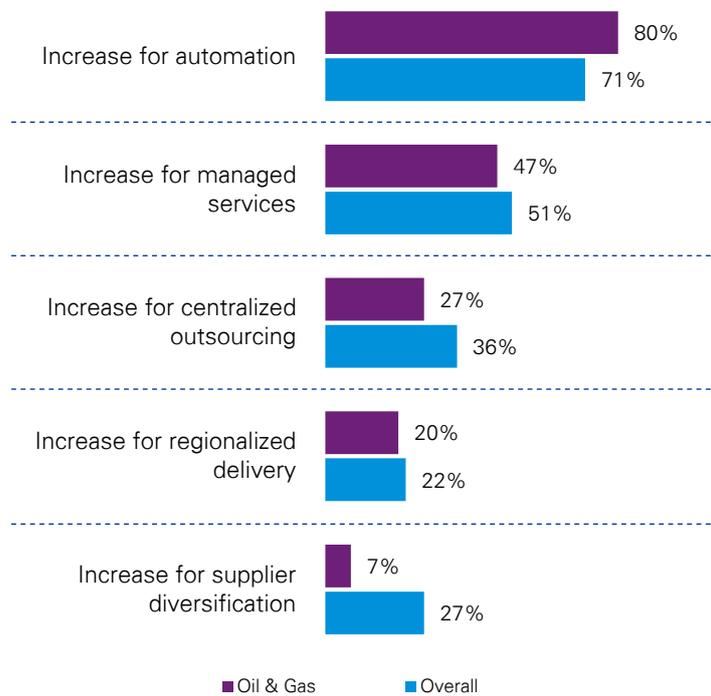
Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Strategy & operating model

In such volatile times, oil and gas companies need more flexible organizational structures, allowing for agile decisions including which activities to outsource and which assets to divest. While outsourcing creates cost efficiencies in oil and gas, it also elongates the process of new capability releases so the right balance between cost efficiency and velocity of the business must be made. Many are rethinking which activities need to be controlled in-house and which can be managed more effectively through partnerships and supply chain relationships. As an industry, oil and gas companies have outsourced and have gone aggressively into managed services in the past so it is no surprise that the industry is lower than the overall averages in these areas – managed services (47 percent vs 51 percent) and centralized outsourcing (27 percent vs 36 percent). The world is also very uncertain from a geopolitical and regulatory standpoint, which can have significant impacts on commodity prices and profit margins. In such circumstances, it is essential to build resiliency with proactive planning, stress testing of internal operations, agile supply chains, and the upgrading of technology to address complex and evolving needs. Physical assets need to be digitized and digital assets need to be monetized – such as digital twin technology that replicates oilfield equipment and processes in a virtual environment to model scenarios that reduce capex or opex. Increasing automation across operations – including drilling, supply chain, and boiler diagnostics – is a strong priority for many (80 percent). Meanwhile, Digital Leaders have a significant advantage over their peers, far out-performing on operational efficiency (75 percent vs 54 percent), time to market (58 percent vs 40 percent) and customer experience (67 percent vs 48 percent).

Expected change to service delivery model:

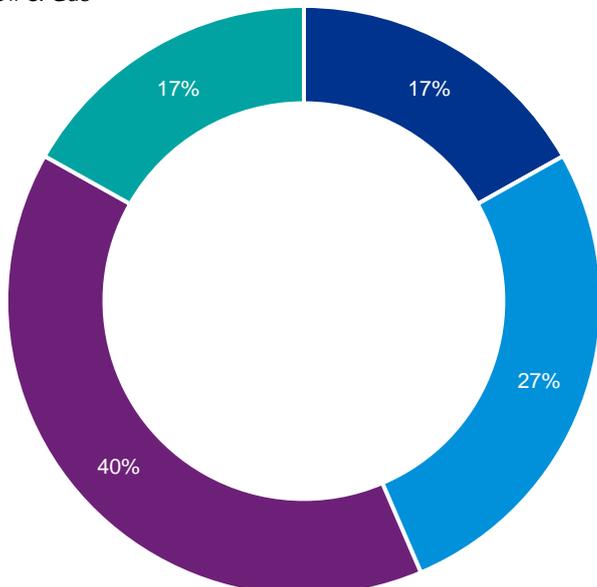
Oil & Gas vs. overall



Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Four economic recovery paths:

Oil & Gas



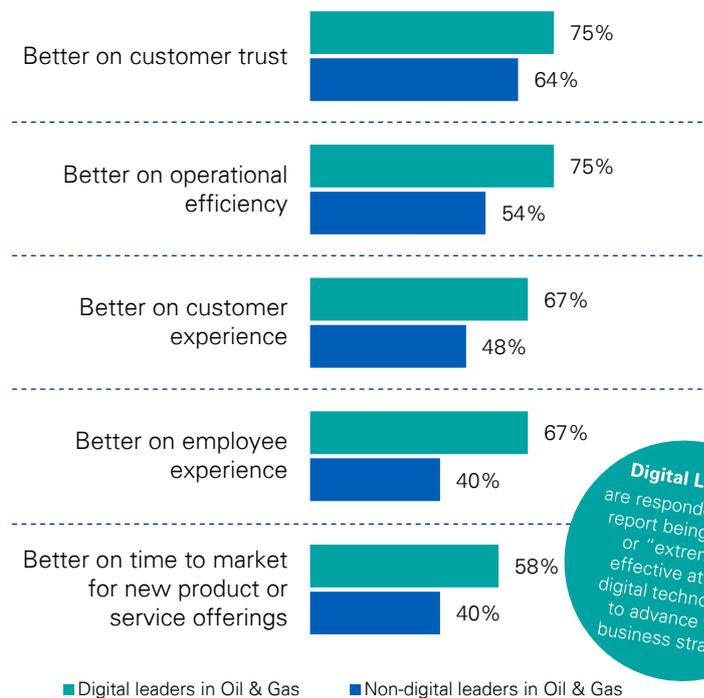
Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International



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Organizations performing 'better' or 'significantly better' than competitors on the following metrics:

Digital leaders vs non-digital leaders in Oil & Gas



Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Digital Leaders
are respondents who report being "very" or "extremely" effective at using digital technologies to advance their business strategy

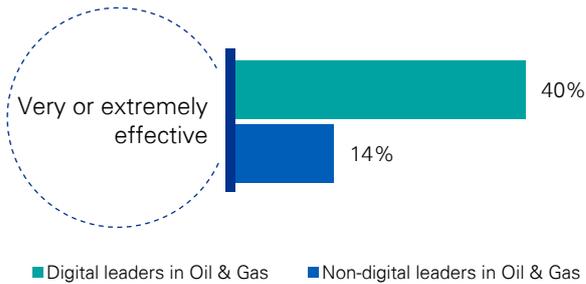
- **Hard Reset** — companies that struggle to recover from COVID-19 due to 'permanently' lowered demand for offerings, insufficient capital to ride out extended recession, and/or poor execution of digital transformation.
- **Transform to Re-emerge** — companies that will recover but along a protracted path requiring reserves of capital to endure and transform operating models to emerge stronger and more in line with changed consumer priorities.
- **Surge** — companies that scale post-COVID-19 as consumer behavior that was altered during the crisis is sustained in their favor. Investors sense their potential to lead and provide capital to scale aggressively during recovery.
- **Modified Business-as-usual** — companies seen as daily essentials will suffer effects of the consumer shutdown recession but are expected to recover more quickly as consumer demand returns in similar volumes.

Delivering value at speed

In order to expedite processes and productivity, IT must support the business in a number of key ways. This includes the increased use of AI and machine learning tools to improve engineering productivity, real-time information retrieval and automation of repetitive processes; and more integrated enterprise architecture to facilitate common data, standards and processes, and real-time information flows. Higher adoption of cloud-based collaboration platforms is also a priority, through which detailed planning and forecasting can be shared and inventory measurement processes for workers in the field can be standardized between E&P companies and Oilfield Service Providers. Remote diagnostic monitoring and preventative maintenance using advanced AI models also play a key role in bolstering uptime and efficiency. Digital Leaders are further along the path than their counterparts, with 40 percent saying they are effective or very effective at pivoting and scaling digital channels to meet new customer demands and expectations, compared to just 14 percent of others. They also hold a significant edge in terms of other key metrics such as increasing revenues, improving customer satisfaction/experience, and collecting valuable data.

Organizations that are 'very effective' or 'extremely effective' at pivoting and scaling digital channels to meet new customer demands and expectations:

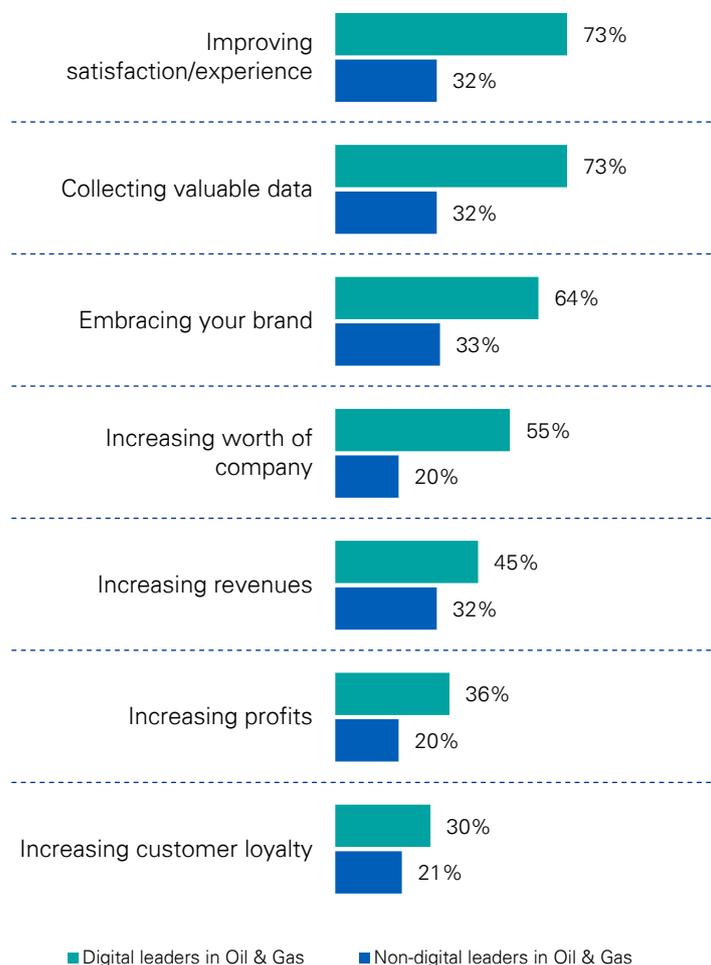
Digital leaders vs non-digital leaders in Oil & Gas



Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Digital offerings to customers that were 'very effective' or 'extremely effective' at the following:

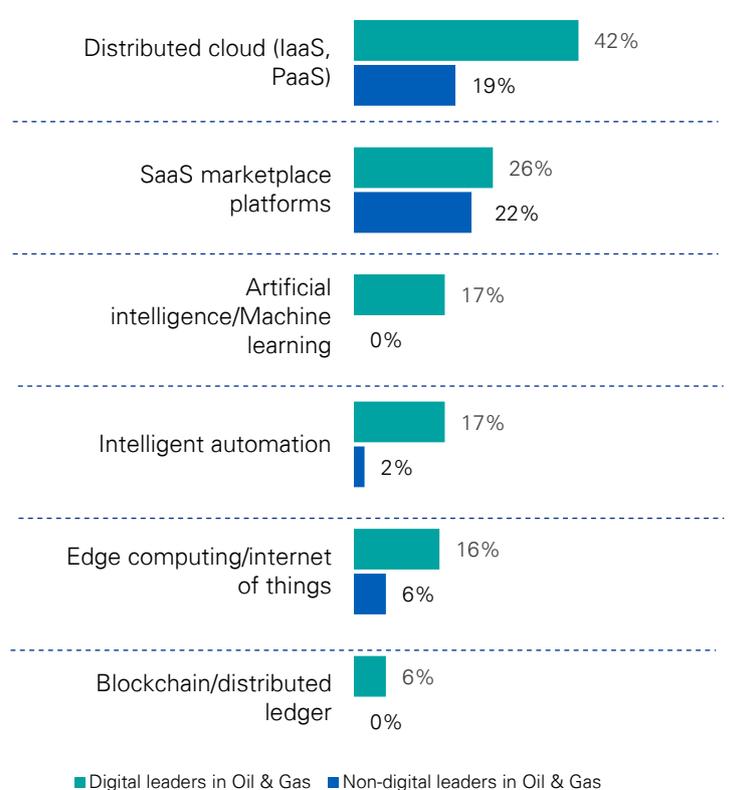
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Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Large-scale implementations of emerging tech:

Digital leaders vs non-digital leaders in Oil & Gas



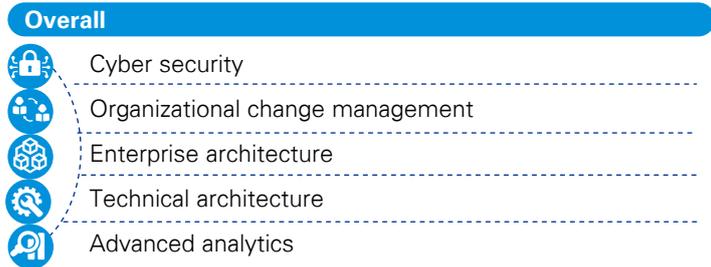
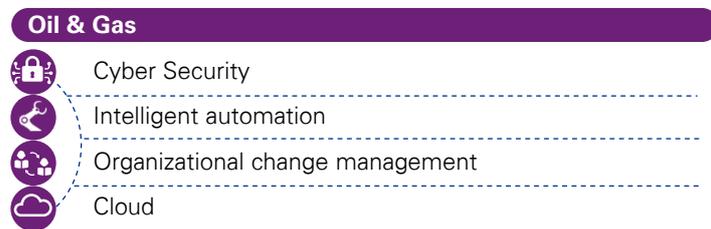
Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

People & culture

With so much for IT to contribute in the transformation of oil and gas businesses, addressing skills shortages must be a key priority. With the aging workforce in the oil and gas sector, technology leaders will need to address the growing talent gap between experienced engineers and junior employees. In this sector, the business has been more successful in attracting talent than IT, and IT leaders are tapping into the technology talent, especially in the areas of automation (number 2 for most in demand skills) and data analysis (where 72 percent cite scaling data analytics skills as a priority for the organization's data strategy). There is no doubt that attracting talented new members – particularly millennials – could become ever harder: the industry has a significant reputational challenge in an age where the low-carbon, sustainability agenda gets stronger as well as an organizational structure that has historically had rigid hierarchies. In line with the cross-sector average, cyber security is the number one shortage for the industry, although it is notable that intelligent automation and organizational change skills are not far behind as the industry looks to hire highly skilled technology personnel and upskilling their existing workforce in response to the new digital paradigm. One positive for the sector is that 70 percent of oil and gas CIOs agree the COVID-19 crisis has permanently created a culture of inclusivity in the technology, significantly higher than the cross-sector average of 52 percent - and a sign, perhaps, that IT teams have pulled together and increased their sense of team spirit in challenging times.

Most in demand skills:

Oil & Gas vs. overall



Top factors in engaging and retaining key technology talent in the new reality:

Oil & Gas vs. overall



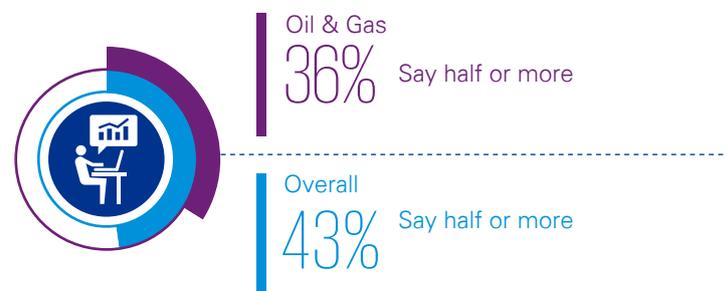
Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

70% in Oil & Gas believe **COVID-19 created a culture** of inclusivity in the **technology team.**

More than half in Oil & Gas believe **promoting diversity** improves **trust and collaboration, accessing the right skills and engagement with the business.**

Proportion of enterprise that will remain predominantly working from home post COVID-19:

Oil & Gas vs. overall



Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

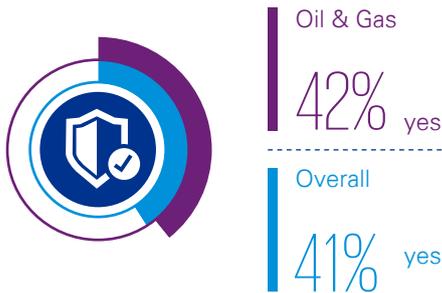
Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

The rise of cyber

With COVID-19 causing the mass relocation of staff from corporate networks to home offices, bedrooms and kitchen tables around the world, organizations' attack surfaces also dramatically grew. As a result, more than four in ten organizations have experienced an increase in cyber security incidents – with oil and gas businesses reporting a particularly large rise in spear phishing attacks (up 90 percent). Ensuring that staff are fully aware of protocols concerning unexpected emails or links remains a high priority therefore, especially where bring your own device (BYOD) approaches have increased. With such critical infrastructure supporting national economies, the energy industry is a primary target for state-run threat actors and industrial espionage, intended to cause maximum disruption, maintaining robust cyber security and protocols on operations, transport and production controls systems - regularly reviewed, updated and tested – will be an ongoing operational imperative.

Organizations that experienced an increase in security or cyber incidents due to remote working:

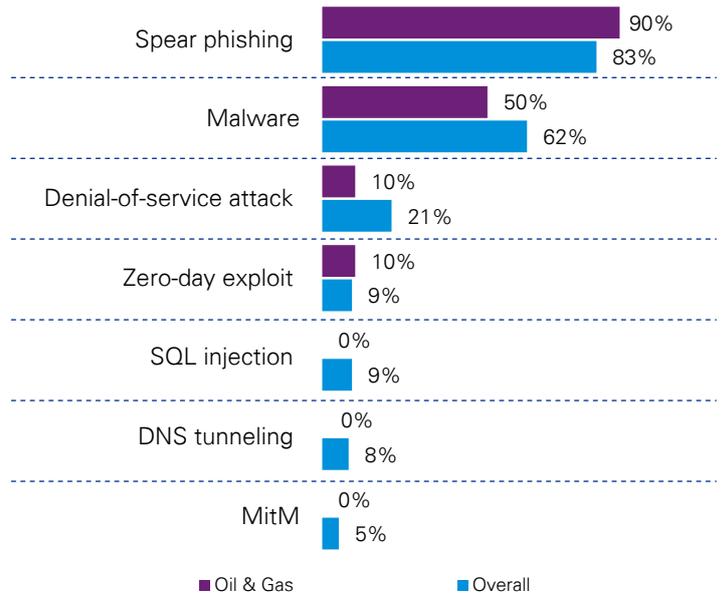
Oil & Gas vs. overall



Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Increase in types of attacks:

Oil & Gas vs. overall



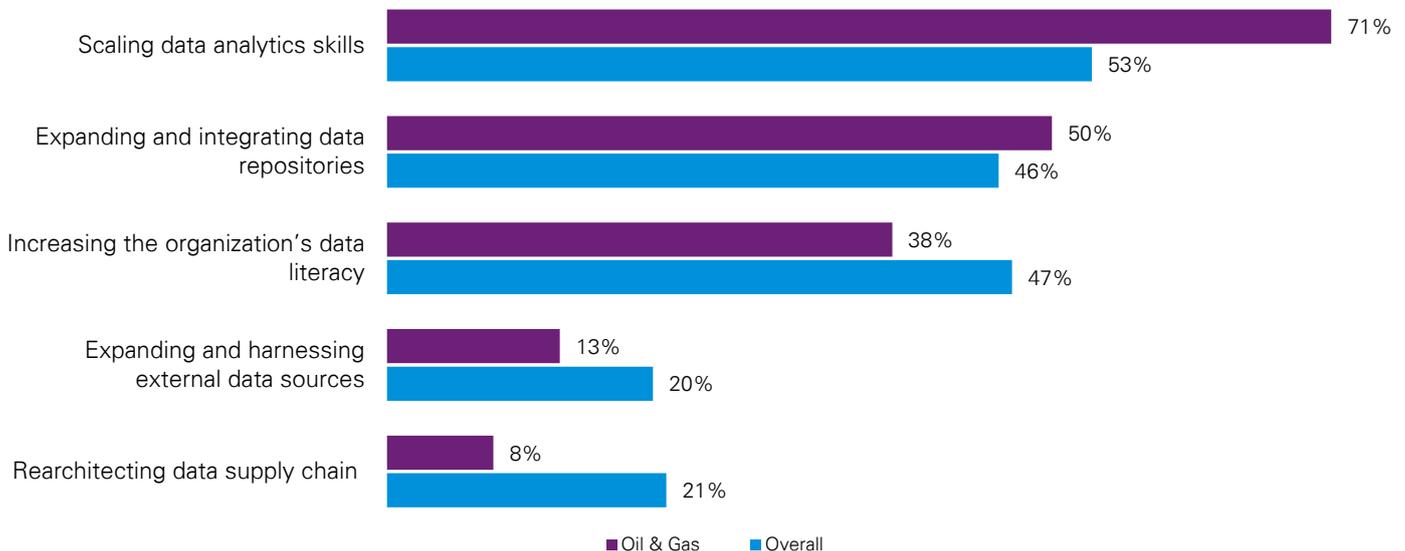
Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

Analytics & insight

In the new reality, oil and gas enterprises will heavily invest in maturing modern data architectures to gain insights into and to shorten decision cycles. Actionable information is needed to identify plays for increased investment and optimization, as well as underutilized assets that need to be disposed of or reimaged. Real-time, accurate and actionable operational data must flow through the business like the resources it produces. To do this, the sector will need to lean in on more advanced IIOT capabilities, advanced networks, and stronger analytics capabilities, and attract new technical talent. It is something that CIOs in the sector recognize, with 71 percent saying that scaling data analytics skills is a priority, with expanding and integrating modern data repositories the next most important task on the agenda.

Priorities for your organization's data strategy:

Oil & Gas vs. overall



Source: 2020 Harvey Nash/KPMG CIO Survey, KPMG International

What now?

COVID-19 has changed the landscape. With technology more important than ever to organizations' ability to survive and thrive, the opportunity has never been greater for CIOs to work as strategic partners with the business. Seven in ten IT leaders report increased collaboration between the business and technology teams – this relationship is something that CIOs must build on to ensure their organization's digital transformation success.

For CIOs in oil and gas, digital transformation must now be accelerated. Being so based around physical products and processes, the sector has lagged somewhat compared to other industries in terms of IT enablement. Now, with cost optimization and operational efficiency gains so critical, the technology function has the opportunity to prove its strategic value and help the business leverage the power of IT to lift processes and performance across the organization.

How KPMG can help

While KPMG firms are some of the largest providers of services to oil and gas organizations globally, we take a boutique approach to client issues with a focus on flexibility, adaptability, and innovation. KPMG firms recognize that there are many on-ramps to supporting IT transformation and we've tailored our services accordingly:

Transform the business

- Strategy and operating model
- Organizational design
- Enterprise architecture
- Portfolio planning
- Merger and acquisition
- Integration and separation

Run the business

- Scaling agile
- Product management
- DevOps tooling
- IT financial management
- IT service management
- IT asset management

Modernize and protect

- Cloud strategy
- Data center strategy
- Continuity and resiliency
- Workplace transformation
- Network modernization
- Cyber, risk, and compliance

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