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Oil and Gas Magazine

Second edition

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Foreword

Digital is the antidote to disruption: Why oil & gas companies must speed up digital transformation

By **Jonathon Peacock**, Global Sector Lead, Oil and Gas, KPMG International

The oil & gas sector is entering a period of ongoing disruption. Companies are being asked to reinvent themselves from the subsurface up. This can best be characterized by the following:

- Performance is being assessed by new measures and metrics.
- They are facing massive changes in the tax and regulatory environments they operate in.
- They are responding to rapidly evolving customer and stakeholder expectations.
- And they are doing so against a backdrop of significant socioeconomic and geopolitical uncertainty.

Digital solutions are one of the potential antidotes to disruption, if applied correctly, in that they can:

- provide oil & gas companies with the data they need to make strategic and operational decisions.
- give them the agility and flexibility to adapt to changing market conditions.
- offer the tools to create and execute new business models.
- form the foundations of the future of work. It can help to reduce risk, enhance insight and drive efficiency.
- deliver the agility that is needed when facing an uncertain future.

Let's show you how

In this edition of *Drilling Down* magazine, we explore some of the use cases that are driving the urgency of the digital transformation in the oil & gas sector. We explore how digital is helping to build customer loyalty and insights as oil & gas companies seek to diversify into new business models. We examine how digital is helping oil & gas tax functions become more efficient and more strategic as tax moves up the oil & gas agenda. We look at how digital twins are driving operational efficiency and value in virtually every part of the oil & gas value chain.

Recognizing the gap between digital ambition and reality, this edition of *Drilling Down* also takes a more holistic view to exploring some of the unique barriers and opportunities facing oil & gas companies as they strive to digitize their businesses. And we offer some examples and case studies from KPMG member firms that work around the world to try to demonstrate how the leaders are overcoming the barriers and embracing the opportunities of digital.

Reading between the lines

As you read the various articles, several central themes should emerge.

The first and most obvious big theme is the need for reliable, integrated and accessible data. Data is the lifeblood of digital. It feeds the digital tools. It leads to new insights. And it can deliver the visibility that oil & gas companies need to drive efficiency and expand into new markets. Oil & gas leaders should start thinking of data like they do molecules — assets that can be refined to create products and competitive advantage.

The second big theme is around skills and capabilities. Indeed, I believe Human Capital will be the next big battleground for oil & gas companies. In part, this is because the oil & gas workforce is shrinking as experienced professionals retire and new talent is pulled toward other industries. At the same time, as oil & gas companies become increasingly digital, new skills and talent will be required and older skills may need updating. Securing, upskilling and developing this talent will need to be high on the transformation agenda.

The third theme that emerges is around purpose and values. Oil & gas companies should have a clear vision of how they expect to play in the new energy environment. They will need to state their ambitions around net zero clearly — not only for their customers and stakeholders but also to retain key talent — and then demonstrate their progress. They will likely need to put ESG considerations at the core of their strategic planning, reducing the risks but also finding opportunities. Understanding the intersections of purpose and profit will be critical.

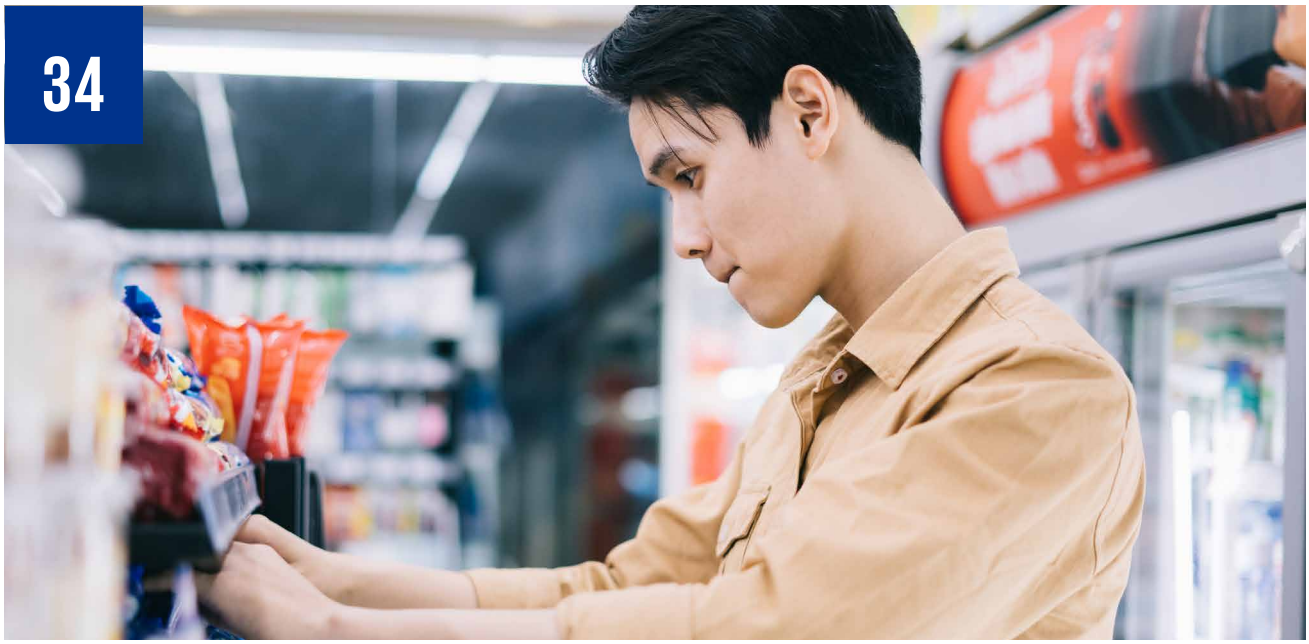
Why digital matters

If you thought the past few years were disruptive, just wait. I believe we have only seen the sparks of disruption; and the fundamental transformation they have ignited are quickly becoming burning platforms for change. Oil & gas companies should be agile if they hope to survive. And a key way to achieve that is through digital. Digital is a potentially strong antidote to disruption and I suggest oil & gas leaders start to rapidly prioritize investment and deploy digital capability across the sector. I hope this publication inspires industry decision-makers to double down on their efforts to drive digital transformation throughout their enterprises and ecosystems. To learn more about the topics raised here or discuss your unique digital transformation opportunities, I encourage you to contact your local KPMG member firm or any of the authors listed in this publication.

Sincerely,

Jonathon Peacock
Global Sector Lead, Oil & Gas
KPMG International

What's inside



Delivering on digital

Activating the transformation

By **Jeff Monk**, Chief Marketing Officer, US Energy Industry, Microsoft Corporation; **Monica Ortiz**, Manager, KPMG in the US; **Jonathon Peacock**, Global Sector Lead, Oil and Gas, KPMG International; and **Rohit Ravindran**, Digital Platforms Lead, KPMG in the US.

The shift from hydrocarbons to electrons is underway. And many energy companies know they need to achieve a digital transformation to survive and thrive in the new energy environment. The challenges are significant. But so, too, are the opportunities.

From hydrocarbon to electron

Investors expect growth. Stakeholders are calling for transition. Customers want diversification. Employees are focused on purpose. And regulators are watching everything. One of the critical ways for energy companies to rise above these pressures and thrive is through digital transformation.

Don't be fooled: digital transformation isn't just about technology. It is also about doing things better, getting better insights, delivering better outcomes and building resilience for the future. It's about knitting together the right capabilities, solutions, models and — yes — technology to deliver on your ambitions for the future. It's about enabling your organization to act with agility as it evolves and building the foundations for growth. If you are starting with technology, you are looking at the problem from the wrong angle.

The key here is to consider what you want to be in the future and what digital capabilities your organization will require to get you there.

If you are contemplating growing your downstream and forecourt business, you will need key insights into your customers, their needs and expectations. If your plan includes diversifying into businesses in adjacent sectors — likely broadening your value chain from hydrocarbons to electrons — you may want to ensure you are making effective use of your data to help manage that complexity and drive those investment decisions. At the same time, your strategy probably involves doing what you do today (i.e., the upstream and midstream parts of the business) more efficiently and effectively, which requires enhanced operational awareness and control.

Now go beyond your business models to look at your broader ambitions. As the next chapter argues, digital transformation is a vital enabler of the energy transition and ESG agenda. If you are a purpose-led organization, your customers, employees and communities expect to see you take action on your promises, to back that action up with reliable data, and to report. Even the fundamental ambition of simply remaining 'compliant' with regulatory and tax requirements increasingly requires enhanced digital capabilities.

Our view suggests that digital transformation will be needed to execute all aspects of an energy company's future strategies. And it will likely be critical to helping manage the risks and uncertainties of the future. Yet building these capabilities, solutions, models and technology ecosystems takes time and experience. You should think about them early, in an integrated fashion and with a clear vision of what you want to be and how you want to be perceived.

How can digital transformation help solve my big risks?

In late 2021, the Eurasia Group and KPMG articulated some big risks facing the world in 2022. Let's look at a few and assess the value of digital

- **Trade, market access and supply chain disruptions.** A digital business can conduct meaningful scenario planning, adjust to changes in trade agreements, and enjoy a deeper insight into its supply chain so it can problem-solve early.
- **A rocky energy transformation.** Digital energy companies see the risks and opportunities and can quickly pivot to accelerate progress or take advantage of new technologies and solutions.
- **Cybersecurity and governance chaos.** An intelligent digital transformation roadmap puts cybersecurity and governance front and center. It works to provide organizations with the data they need to remain in control of their operations and data.

How digital delivers on sustainability

As energy companies look to meet their ambitious Net Zero goals, digital is increasingly seen as the lynchpin. Digital can be a key enabler of the energy transition; it can help drive and be a mechanism for transparency.

For example, consider how digital can help your organization reduce direct emissions. By digitally preparing for service and maintenance calls before dispatch, energy companies can reduce truck rolls and waste at the frontline. Digital can improve planning cycle times and remove process variances that often lead to routine flaring (a significant cause of emissions). Digital can help accelerate leak detection and mitigation, reduce upset conditions, and help manage energy consumption.

Or consider how digital can help drive indirect (or Scope 2) emissions. With the right data and insights, supply chains can be optimized. Waste can be removed from the process. And cleaner, greener suppliers and supply routes can be found. Digital can speed up the requisitioning process and ensure supplies are available at the right time, in the right place, and for the right people. And it can allow energy companies to better track their climate change efforts (and those of their suppliers and suppliers' suppliers) down the value chain.

Digital can also have a massive impact on your Scope 3 emissions. Moving from in-house servers to the cloud doesn't just move emissions from Scope 1 to Scope 3; it can also help eliminate them. Microsoft Azure™ cloud[1] is offering energy companies with a more sustainable set of products and technologies.

Indeed, there is a wide range of ways that data and digital can help drive the ESG agenda for energy. When Microsoft and KPMG firms work with clients, they often help them understand and quantify the climate impact of activities not usually considered within the traditional sustainability envelope.

KPMG firms and Microsoft show decision-makers how ERP modernization can allow them to integrate their data and improve their governance and reporting around climate impacts. The goal is to help them see the link between connected assets, operations, and data. They are shown how efficiency, skills enhancement, and collaboration can enhance the impact of their digital workforce on climate activity. The lines between ESG compliance, reporting, and data are clearly drawn.

Digital is the lynchpin to meeting your climate and Net Zero goals. It should be at the center of your strategy.

Where are the linkages?

1. **Reduced planning cycle time, process variance and downtime** = reduced routine flaring, improved site remediation and better managed energy consumption.
2. **Enhanced demand intelligence, asset health and product design** = a more balanced supply and demand, reduced upset conditions, and better product innovation.
3. **Improved raw material handling, dispatch and route planning and asset integrity** = faster leak detection, proactive leak mitigation and reduced emissions.
4. **Optimized resource management, asset performance and stoppages** = reduced process flaring, more rapid intervention and preventative measures.

[1] Microsoft, Microsoft will be carbon negative by 2030

Getting your arms around the data

If digital is the conduit, data is the liquid that flows through it. There is no use for digital without data. And the wrong data — or disconnected and unstructured data — can make a digital strategy ineffective. Simply put, at the center of every great digital strategy is great data.

But for the value of digital to be achieved and for use cases to be fully realized, data must be accessible, trustworthy and secure. It needs to flow to the right points, integrate with other data sources and deliver actionable insights. The problem is that most energy data currently in existence (and there is a lot of it) is locked up in siloes, stuck in the supply chain and purposefully separated between assets and systems.

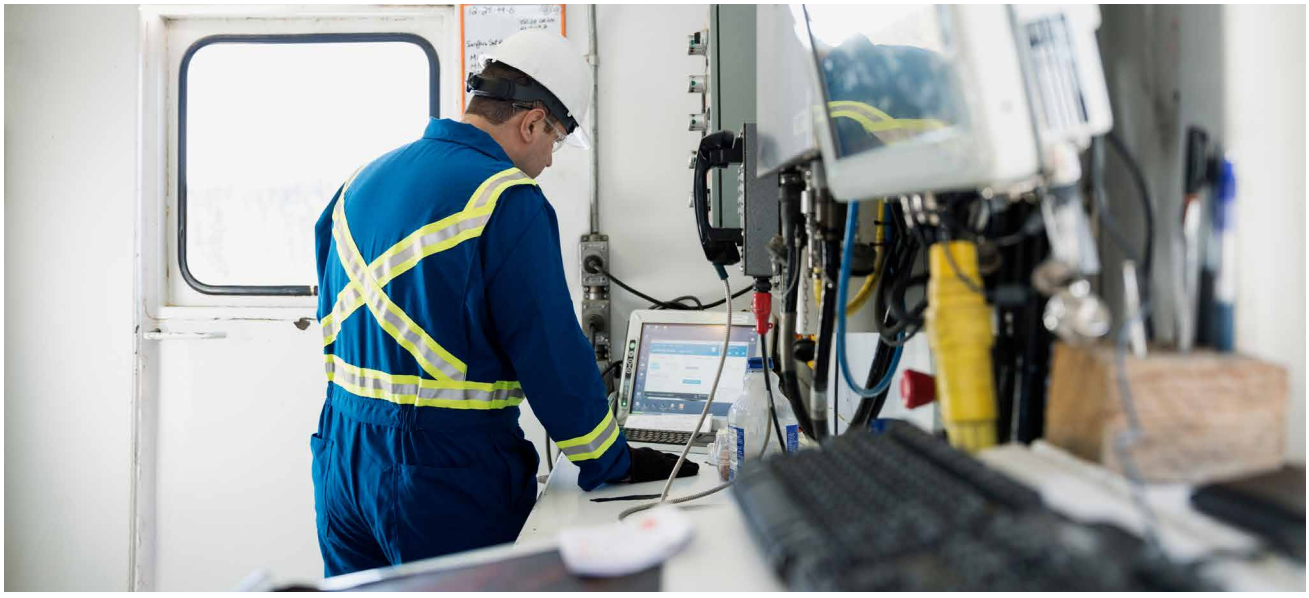
This inability to harness operational and IT data hinders the company's efforts to modernize its organizations, enhance its processes and improve supply chain collaboration. It reduces the returns energy companies can reap from their investments. It erodes decision-making confidence and creates multiple versions of 'the truth'. It undermines growth.

A well-planned digital transformation starts with the data. And when Microsoft and KPMG firms work with clients in the energy sector, the focus is often on helping organizations achieve high-fidelity, real-time and trustable data and insights from their digital investments.

Cloud technology can play a crucial role here. Cloud solutions like Microsoft Azure can bring data from disparate systems together, provide the platform upon which it can be analyzed, deliver the processing capabilities and governance controls required, and do it all within tried and tested industry solutions. The cloud also allows organizations to see their data across complex systems — new and legacy.

If your organization is already migrating systems to the cloud (perhaps as part of an ERP modernization initiative), this is your opportunity to get your arms around your data. It's also your opportunity to understand your data needs, assess your data quality and integrate new sources of data that can provide even deeper insights (such as sensors, supplier data or climate data).

The good news is that there are organizations — like Microsoft and KPMG — with deep experience helping similar organizations get their arms around their data. Indeed, the data challenge can quickly become a data opportunity with the right connections. The next chapter explains how.



It takes an ecosystem

You have an aggressive digital agenda. But do you have the right in-house skills, capabilities, people and talent to deliver? Digital transformation is a massive and complex project. And KPMG's experience suggests that only one-in-three transformation projects deliver on their value expectations.

It requires a wide range of new skills and job profiles, including data scientists, software engineers, agile coaches, cybersecurity professionals and DevOps engineers. It involves energy companies stitching together a range of different systems and technologies — some new, some legacy. It takes smart change management and transformation skills to drive use and adoption. It also requires existing employees to upskill and learn new digital capabilities.

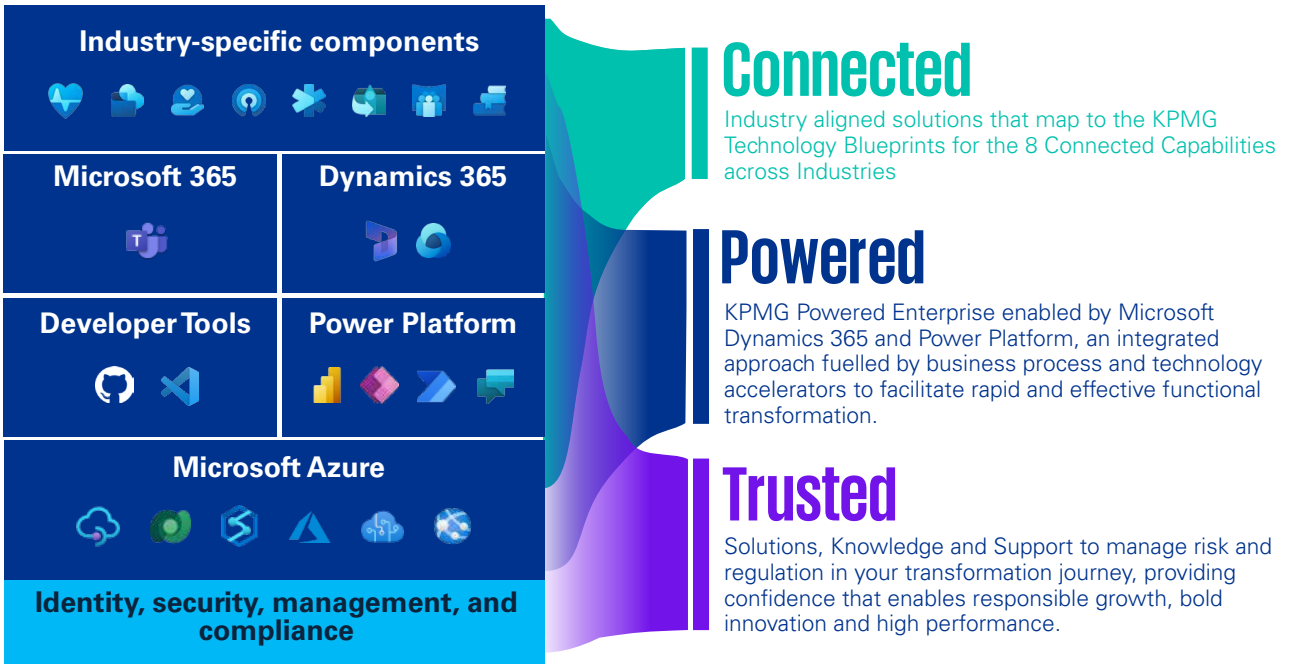
At the same time, no organization wants to reinvent the wheel — and nor should they. The world is filled with best practices, frameworks and solution sets that have been tried and tested in other organizations, situations and environments. The trick is to identify and apply the right ones for your organization.

The problem is that — in today's tight human-capital environment — recruiting, developing and retaining experienced, skilled talent and capabilities is challenging. Energy companies compete against virtually every other company in the world for digital skills. Finding enough of the sort that meets your specific needs may not be easy.

If you can't buy or build it, you'll need to partner. And here, too, KPMG firms and Microsoft have seen significant changes in the market. The digital transformation agenda is being delivered by creating ecosystems of players that work together, invest together and innovate to deliver on the digital transformation agenda, rather than relying on one-on-one tie-ups. It's about bringing together diverse perspectives, new capabilities and additional capacity to help the organization meet its goals.

KPMG firms and Microsoft often work together at the cornerstone of these collaborations. In the energy sector, the KPMG and Microsoft alliance enables us to identify and integrate players with proven capabilities and solution sets and help ensure alignment, collaboration, and delivering the value of digital by working closely together.

No organization can likely navigate the scale of change required by digital transformation alone. Therefore, the real challenge facing energy companies is finding the right help with the right capabilities and skills to get you where you want to be.



Seeing the upside of cyber

One compromised password — that's all it took to knock out 5,000 miles of gas pipeline.[2] Ransomware was installed. Critical business applications became unresponsive. The owner had no choice but to proactively shut down their operations. It's a horror story no energy company wants to experience. And it's a risk that no government or regulator wants to leave unmitigated.

The topic of energy infrastructure security is top of mind for politicians and policymakers around the world. From ransomware attacks to suspected nation-state hacks, regulators and governments are enacting a range of policies to ensure their critical infrastructure is resilient, safe and secure. The path to digitization must be a safe one.

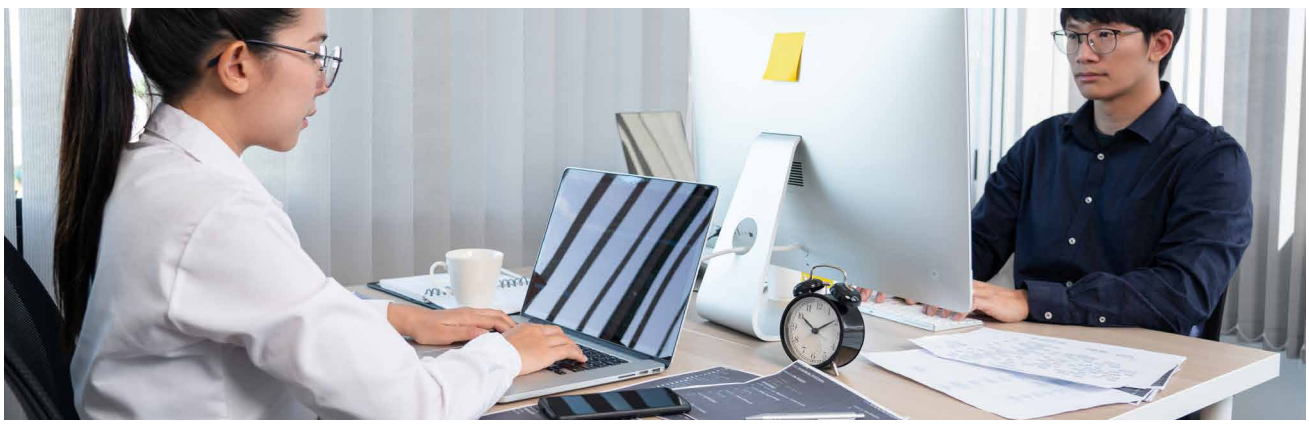
Yet there is natural tension. On the one hand, energy companies should open up their data, integrate it across IT and OT, and make it accessible across the ecosystem. But on the other hand, they are ultimately responsible for keeping that data safe and secure. The tendency is to fall on the side of risk mitigation.

Energy leaders would be better served to see cyber as an opportunity as much as a risk. A robust and defensible cyber position gives the organization the confidence it needs to bring important data sets together. It allows the organization to be more agile, aggressive when entering new markets, and competitive when working with customers. A robust cyber stance isn't just about protecting the organization from risks and fines; it's about preparing the business to grow and thrive.

As such, energy companies should think carefully about how cyber is embedded into their digital transformation plans and operating models. They will want to select partners that can offer high levels of security. And they should consider how they can get ahead of cyber risks and requirements to ensure the value of the digital transformation is delivered.

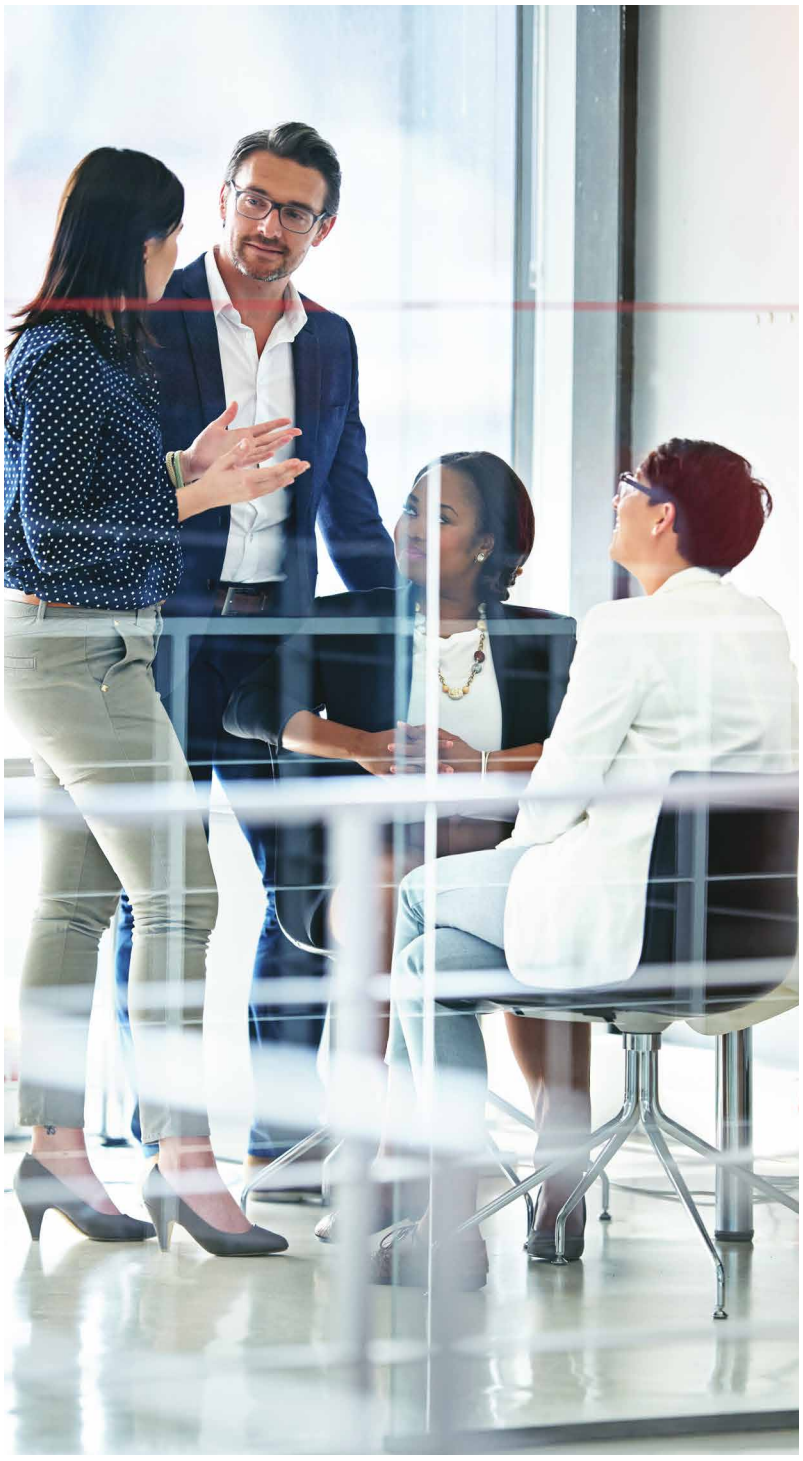
Key takeaways

- Energy companies should consider reinventing their business models with a sense of urgency
- Digital transformation is required to deliver on the expectations of investors, employees and customers
- Start by focusing on the big risks and opportunities — climate change, cyber, cloud migration and energy transition, for example
- Don't underestimate the value and importance of reliable, high-fidelity, real-time data
- Digital transformation is a massive undertaking, but there are best practices, solutions and partners that can help.



[2] Bloomberg, Hackers Breached Colonial Pipeline Using Compromised Password, June 2021.

KPMG and Microsoft



KPMG and Microsoft combine advanced technologies, industry insight, creative thinking, and established excellence in advising on complex global business issues to help transform your company in the areas most critical to your prosperity and ongoing sustainable success.

The strong portfolio of KPMG and Microsoft alliance offerings can help you address these challenges by building applications, automating manual processes, and continuously analyzing information to help reduce the risk of errors and increase your ability to make smart decisions. As you embark on your digital transformation journey, you can rely on KPMG professionals and our business-first approach to deliver effective Microsoft technology-based solutions to help you achieve meaningful and sustainable business outcomes.

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About the authors

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Based in Houston, Jeff is a 25-year veteran of the Energy Industry and has held operational and commercial leadership roles as the US Region Director for Siemens Energy, Global Director of Oil & Gas for GE Energy's Aeroderivative Gas Turbine business, and as VP of Strategic Accounts for GE Oil & Gas and its subsidiaries.

Currently Jeff leads Microsoft's go-to-market strategy for the Oil & Gas and Power & Utilities Industries. In addition to advocating on behalf of the industry inside Microsoft, he brings a unique perspective on the role that technology can play in improving safety, optimizing operations, and accelerating the adoption of technology across the energy value chain.

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Monica is a Manager with KPMG Platforms Microsoft team and leads digital & cloud transformation, business advisory engagements to a fully integrated ERP system. She bring hands-on experience with full cycle close, practical application of accounting methods, internal & external reporting, and system implementations to help harmonize data and streamline process design to help clients derive higher Return on Investment (RoI).

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Jonathon has more than 30 years experience in a variety of strategy, operational and project management roles in military, corporate and consulting organizations. Since joining KPMG in 2009 Jonathon has worked across a wide range of industries including: Energy & Natural Resources, Financial Services, Government and a range of corporates, advising on strategy, business transformation, operational improvement and effective change management.

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Rohit has 25 years of experience in technology-enabled business transformations. He specializes in leading large technology programs that enable value for businesses through the KPMG and Microsoft global strategic alliance. He is experienced in working with clients in finance, human resources, procurement, supply chain, operations, sales/marketing, and information technology industries.

Get more from your twin

The new epoch of digital twinning

By **Peter El Hajj**, Digital Twins Lead, Net Zero Urban Program, KPMG in the UK; **Ronald Heil**, Global Cyber Security Leader for Energy and Natural Resources and Partner, KPMG in The Netherlands; **Kimberly Sorensen**, Principal, CIO Advisory, KPMG in the US; and **Candice Wilson**, Director, Energy Solutions, KPMG in the US.

The oil and gas sector has been virtualizing processes and assets for years. But are their digital twins delivering the value they could?

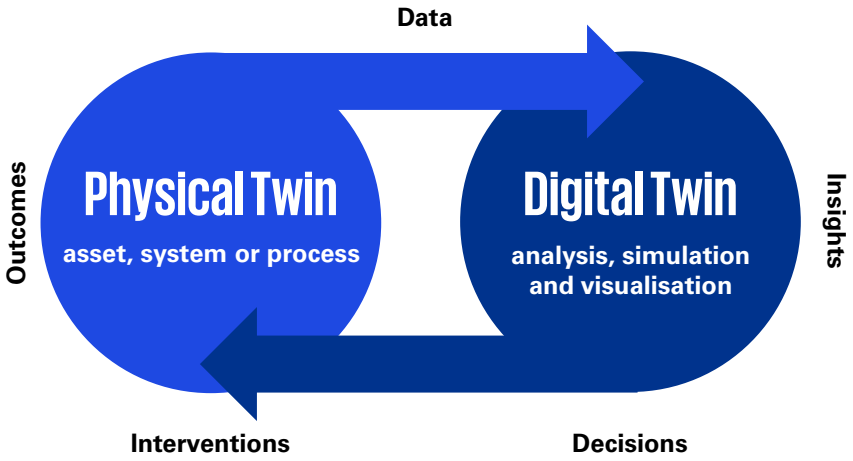
What it is and what it isn't

You're no stranger to digital twins. For decades, oil and gas players have created digital representations of assets and processes. Operators have been digitally simulating everything from offshore platform operations to subsurface reservoirs on the upstream side. Midstream players have been virtualizing pipelines and processing facilities. Downstream players use digital twins to monitor their operations and optimize maintenance schedules.

Digital twins are everywhere. And the term can be equally applied to a wide range of technologies and approaches. A digital twin could be a straightforward visualization technique — like a graph or a chart. Or it could be a highly immersive visualization environment (or HIVE) where operators can view, monitor and remotely control an asset or process. It might be a digital representation of an object, an asset, a process or a system. And it could be used for anything from training to operation.

Midstream players have been virtualizing pipelines and processing facilities. Downstream players use digital twins to monitor their operations and optimize maintenance schedules.

Digital twins overview



Source: KPMG Analysis

What makes a digital twin valuable, however, is that it is connected to reliable and relevant data streams. The more 'right time', the better (live data may not always be what's required). Regardless of their form or application, a digital twin should have a clear purpose, such as to allow decision-makers to reduce risk and increase business value. And to do that, it must be founded on quality data.

Your oil and gas business will likely use digital twins across the asset lifecycle. In the project design phase, your engineers and planners may use digital twins to conduct remote field walkthroughs or enhance spatial awareness and orientation. Your project managers are probably using digital twins to track execution progress. Operations leaders may use them to stress test cost and scheduling parameters or to conduct operator training.

In the operations phase, digital twins are helping reduce FTE requirements by allowing central remote operations, and by ensuring operators are well trained and informed. They are being used to monitor operations, components or flow streams remotely. They enable operators to optimize processes and equipment in real-time or to conduct emergency response. Maintenance schedules are being optimized. Downtime is being reduced. Risks are being better managed.

The big question, therefore, isn't whether or not you need digital twins — it is whether your digital twins are delivering as much value as they could.

	Digital Twin Functionality		
Activity/ Function	**Visualization** 	**Monitoring** 	**Simulation** 
Project Design, Build, Startup & Handover	Virtually explore project design and have instant access to detailed blueprints and other key documents **FTE and OPEX Savings**	Efficiently track project execution **FTE, CAPEX, and OPEX Savings**	Capital project design and cost and schedule stress testing **FTE and OPEX Savings, *possible CAPEX savings***
Operations & Production Optimization	Remotely identify and diagnose operational issues and constraints in the production system; improve safety planning (simops and hazops) **FTE and OPEX Savings, Safety**	Remotely monitor facilities and processes to minimize downtime and unexpected events **FTE and OPEX Savings, *possible Production Uplifts***	Continuously optimize facilities operations and simulate "what if" scenarios with minimal risk **Production Uplifts**
Engineering & Maintenance Effectiveness	Rapidly, remotely, locate and disaggregate equipment packages to improve work preparation and execution safety **FTE and OPEX Savings, Safety**	Generate real-time, aggregated data streams from operating equipment and maintenance operations **FTE and OPEX Savings, *possible Production Uplifts***	Optimize maintenance schedules and evaluate impact of potential modifications **FTE and OPEX Savings and Production Uplifts**

Finding the value sweet spot

Some digital twin use cases can deliver a bigger bang for the buck than others. If you operate a brownfield (i.e. already built) asset nearing its end of life, you may be challenged to justify the costs and disruption involved in creating a digital twin. Once you add up all the resources required to implement new technologies, new data management systems and new processes, you may find the business case doesn't stack up.

If you are building greenfield (i.e. from scratch), however, the equation flips. Building a digital twin of a new offshore platform after the fact would be like telling an electrician not to wire a new house until the interior has been plastered and painted. The earlier in the process, the lower the cost and disruption, the greater the value over the lifecycle.

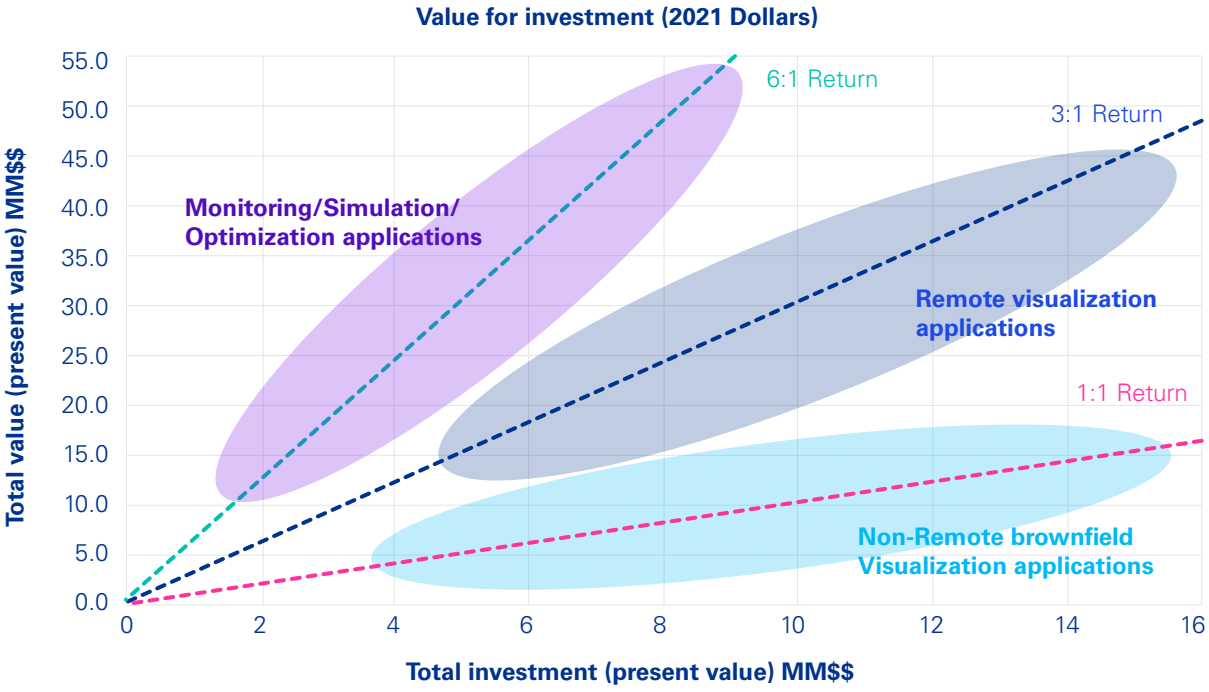
Oil and gas infrastructure is a complex network of assets and systems that come together to enable safe extraction, treatment and flow of resources. As the use of digital twins grows, they will extend beyond individual assets, and into the systems and system-of-systems they are part of. And this will release more value to the entire enterprise.

KPMG firms work suggests that the return on investment can also increase significantly depending on their application. Where a non-remote brownfield visualization application (like, for example, an operator training module) might deliver a 1:1 return, a remote visualization application could provide a 3:1 return (mainly by reducing the need for engineers or technicians to visit the site). An application that allows monitoring, simulation and optimization could provide a 6:1 return.

The ultimate value would be a digital twin that provides a highly immersive optimization environment of an integrated system-of-systems. In the oil and gas sector, that utopia might be an ecosystem of connected digital twins that provides visibility from upstream to downstream, across the end-to-end oil and gas operation. Some cities are moving in that direction — using digital twins to optimize their assets and resources, to prioritize investments and to reliably monitor ESG impacts and goals by taking a 'whole system' approach.

Ultimately, the true value of a digital twin depends on the reliability and richness of the data that feeds it. More often than not, that means starting with the IT and OT data.

~~Digital twins overview~~



Source: KPMG Analysis

At the IT/OT interface

In the last edition of Drilling Down Magazine, we encouraged readers to focus on the security of their operational technology (OT) environments to reduce risk. When creating digital twins, however, you will likely want to integrate your IT within your OT. Without real, live operational data, your insights may be limited to what happened in the past; you won't be able to influence the present or adequately predict the future.

Some old-school operators will shudder at the thought. In the past, common wisdom suggested the only way to keep OT data truly safe was in a walled garden — isolated from other networks. When hackers proved they could vault over the existing walls, most operators built taller walls. Now they are increasingly being asked to pull down those walls and to proactively integrate their data into the broader IT environment.

Even if they wanted to, integrating that data is a formidable challenge. For brownfield assets and systems, it would require significant changes to current data flows, processes and controls — both on the OT and the IT sides of the house. Security and governance would need to be updated and enhanced. New analytics technologies and capabilities would need to be bought, built or borrowed. In regulated areas, the transformation could be exceedingly complex.

Once again, greenfield sites may offer an easier route to value. In a greenfield situation, you can ensure that data security and integration are baked in the right from the start. You can test capabilities before they are applied in operational environments. You can plan for interoperability between IT and OT.

For some oil and gas organizations, integrating and analyzing IT and OT data may require quick progress on the digital transformation journey. It will also necessitate a greater focus on building the human skills and capabilities to turn that data and digital twin into tangible and measurable value.

Data meets experience

You can build a virtual model of almost anything. But it is only significant when you have the skills and capabilities to turn the data into value. You need to partner people with machines. You need to combine data with experience. You need to put the information into the hands of the people that can make decisions.

In part, this is about building strong partnerships between the business and IT. The business needs to articulate the need, quantify the value and develop the supporting capabilities. IT departments should ensure that best practices are shared, efficiencies are captured, and the technology is safe and secure. That requires a true partnership between the business (which includes operations, finance, supply chain and planning) and IT.

Together, they must think through the people, data, technology and system requirements that will need to be in place to ensure that the digital twin is aligned with and delivering on the business' objectives. Then they will want to consider where they can demonstrate near-term value while sustaining business value and support. These partnerships and collaborations will become increasingly important as the sophistication and complexity of digital twins grow — from processes to assets to systems to systems of systems.

KPMG firms experience suggests that oil and gas companies will want to take a pragmatic and practical approach that can generate value, builds capability and enhances sophistication over time while simultaneously managing risk and improving control. Finding that balance will not be easy.

How a digital twin helped create EUR2 million in new revenue

"Could we generate more output power from our existing turbines?" a European energy company asked KPMG in the Czech Republic. The company had vast amounts of performance measurement data, market data and external source data available. But it didn't want to risk shutting down one of its wind farms to conduct physical experiments. A digital twin would be needed.

KPMG in the Czech Republic developed digital twins using mathematical and AI prediction models to forecast the maximum achievable output power based on different wind turbine settings, wind strength and direction. That allowed the team to test whether different positioning of the nacelle and blade angles might deliver more output power.

The digital twin demonstrated that turbine performance could be improved by up to 2.9 percent — allowing each turbine to generate more electricity, worth up to EUR9,300 per year. With some 200 wind farms in this organization's portfolio, that could add up to EUR2.2 million in additional income.

What does the future hold?

If the promoters of the metaverse are correct, every aspect of your life will soon have a digital twin (even you). And while the oil and gas sector has often led this area, most other business sectors are rapidly catching up. We are seeing increasing digital twin sophistication in infrastructure, government, transport, retail and consumer sectors.

This means that skills, capabilities, technologies and use cases are about to grow exponentially as companies and investors pour capital into research and development and as students and digital natives develop more experience using them. The network effect is strong with digital twinning — the more data, processes, assets and systems are tied together, the more value is generated. That is true at an asset, organizational and ecosystem level.

KPMG firms experience suggests that external pressures — like the Environmental, Social and Governance (ESG) agenda — will drive continued adoption and sophistication of digital twinning. Digital twins are an excellent way for investors and owners to monitor their critical ESG indicators. They also allow decision-makers to test and assess the impact of their decisions on ESG metrics before implementing them. As the drive to NetZero picks up pace and expectations rise, digital twins will play an essential role in the oil and gas response.

KPMG professionals advice to oil and gas leaders is to speed up the digital twin journey to capture the actual value that is available and build capability and capacity. Very soon, everything will have a digital twin. Having the appropriate technologies and capabilities will be key.

Key takeaways

- **Put integration over implementation.** Start by thinking about what data, technologies and systems can be integrated rather than what new technologies should be implemented.
- **Understand the business objectives.** Digital twins can do a lot of things and deliver on a wide range of objectives so make sure you have a good understanding of what you want to achieve.
- **Build partnerships to build value.** Ensure that the business and IT is working closely together to mitigate the risks and maximize the value that you can create.
- **Be pragmatic in your approach.** Build capabilities and sophistication over time, while simultaneously maturing your risk and cyber capabilities.

How KPMG can help

Regardless of the stage of your digital twin journey, securing support from a strategic partner can help to build and sustain an enterprise capability and can enable you to double down on the realization of benefits and keep your program on schedule.

KPMG professionals can help by augmenting your internal resources and delivering successful strategic digital twin programs. With knowledge of the possible pitfalls, and the vendor ecosystem, KPMG professionals can build complex analytical models, understand the socio-technical change impact and can articulate the value at within your organization.

KPMG professionals can help by augmenting your internal resources and delivering successful strategic digital twin programs.

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Tax in a digital world

Transform tax, transform value

By **Claire Angell**, Head of Tax for Energy and Natural Resources, KPMG in the UK;
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As tax moves higher up the agenda for oil and gas companies, the need for a digital tax transformation is becoming more critical. Here's how oil and gas finance and tax leaders can transform their tax function to transform value.

The big disruptor: Tax moves up the Oil & Gas agenda

The OECD isn't your typical disruptor, nor are most tax authorities. But, over the past few years, tax authorities, governments, and Non-Governmental Organizations (NGOs) have radically changed the corporate tax environment. The impact has been disruptive — particularly to the oil and gas sector.

The OECD's progress on Base Erosion and Profit Shifting (BEPS) and Pillar 2.0, for example, introduces a global framework to ensure large multinational enterprises pay a Global Minimum Tax of 15 percent on the income arising in each jurisdiction where they operate. This is disrupting many a company's strategic tax planning with a heightened focus on digital tax transformation.

At the same time, tax authorities are also becoming more proactive. Tax authorities reach into taxpayers' invoicing systems in many markets and determine indirect taxes in real-time. Many are already exploring how they might similarly reach into a company's Enterprise Resource Planning (ERP) system to conduct automated tax reviews, assessments and audits. And they are starting to think about how they would want taxpayer data to be organized to make that process easier for them.

Many governments are using tax as both a Big Stick and a Big Carrot to help accelerate their energy transition and climate agendas. That has led to a complex array of new taxes, incentives and credits in virtually every market around the world. The slew of new measures announced in the US Inflation Reduction Act serves as a case in point. And remember that all countries and territories offer different regimes. Navigating the complexity and options is challenging.

The challenge for oil and gas leaders is that all of this tax disruption is coming at a time of massive strategic and business model disruption — including the most significant business disruptor of all, the ESG agenda. Tax touches all pillars of the ESG agenda. Oil and gas players are diversifying into new lines of business, growing their downstream capabilities and investing in adjacencies (like renewables) and entirely new business models (like the metaverse). The tax implications will be tremendous.

Responding to all of this change in the tax environment (and, most importantly, ensuring compliance) will require a massive shift in how oil and gas companies currently manage their tax function. There is bound to be more disruption.

A closer look at the US Inflation Reduction Act

The Inflation Reduction Act includes a wide range of different tax incentives and benefits, including a robust package of energy and climate related provisions. It is notable not only for the numerous new energy tax incentives it provides but also for the number of new mechanisms employed to deliver these incentives.

In some instances, the new law provides for direct payments from the federal government to taxpayers (if they don't offset income). In other cases, the tax credits can be transferred or sold to other taxpayers. Together, these new mechanisms require taxpayers and the IRS to think differently about long-held concepts of the US system.

Many governments are using tax as both a Big Stick and a Big Carrot to help accelerate their energy transition and climate agendas.

The urgent need for tax transformation

As tax moves up the agenda, the tax function is becoming more visible at the decision-making table. Oil and gas executives are increasingly looking to their tax leaders to be more strategic. They want to see various tax scenarios as they plan their business strategy. They expect their tax leaders to bring them ideas and opportunities to help drive growth. They want to know their tax professionals are on top of changes in the international tax environment. They want their tax professionals to protect the tax reputation of their organization.

Like other parts of the business, tax is under pressure to move faster and with more agility. Tax professionals are being asked to cover more ground — they need to understand the nuances of ESG reporting, the impact of digital taxes and the complexities of retail taxes, for example. They also need to be increasingly efficient, effective and capable in their compliance and reporting activities. Yet few are seeing a commensurate increase in budgets or headcounts to handle the expanded scope. And this type of Do-More-With-Less mantra does little to inspire transformation.

This is at a time when the urgency of tax transformation is becoming critical. Generally speaking, tax technology infrastructure at most oil and gas companies is due for an overhaul. Excel spreadsheets are everywhere. Data from different ERP systems don't always correlate. A recent survey by KPMG International finds that 64 percent of Chief Technology Officers say their tax personnel spend more time data collecting and getting data ready than performing tax analytics.[3] Even when tax data is available, only some organizations use it strategically.

Most oil and gas tax functions now find themselves at a pinch point. The business expects them to be more strategic, efficient and capable. But tax functions need more technology tools, capability and capacity to deliver on those expectations. Digital transformation is the only solution.

Digital transformation offers tax functions a clear path to strategic value delivery. It allows existing processes to be re-engineered with fewer manual touchpoints and greater agility. It introduces self-service functions, automation and machine learning, freeing human resources for more strategic and value-adding tasks. It offers opportunities to 'tax sensitize' data across siloes to deliver a single source of the truth. It creates room for new operating and sourcing models.

Digital transformation can enable oil and gas tax functions to automate the manual and repetitive, offload the tactical, take on the strategic, and deliver real value. There are a few other options given the expectations for the tax function going forward.

Where are tax functions investing?

According to KPMG's annual benchmark survey of energy, power and utilities tax leaders, 88 percent of tax functions plan to increase their investment in tax-specific technologies.[4] Three-quarters plan to increase their use of enterprise finance IT systems for tax purposes. When asked where they would put an extra dollar of investment if they had it, most frequently, they said they would invest in tax technology.

[3] KPMG, 2022 Chief Tax Officer Outlook

[4] Global Tax Department Benchmarking report, KPMG International, 2021

Data will drive the agenda

The drivers of digital transformation for the tax function are everywhere — greater demand from the business, rapidly changing regulations, heightened tax authority expectations, efficiency objectives, talent shortages — the list goes on. But we expect what will ultimately force tax functions to transform will be the need for more reliable and accessible real-time data.

The following 18 months will see tax functions looking for — and being asked for — increasing amounts of data. Internally, the pressure for more forward-looking tax scenarios and insights is forcing tax leaders to reassess the freshness and accessibility of their data. They want to provide the business with accurate and strategic forecasts, but they can't always trust the data they receive from multiple systems.

Consider the data requirements for applying for various sustainability-linked tax credits and incentives. That will require tax functions to access new data sources that may or may not currently exist. Where it is available, it is likely spread across various processes, systems and assets in different formats and degrees of completeness and transparency. Some of it may need to be lifted from third-party service providers or Joint Ventures.

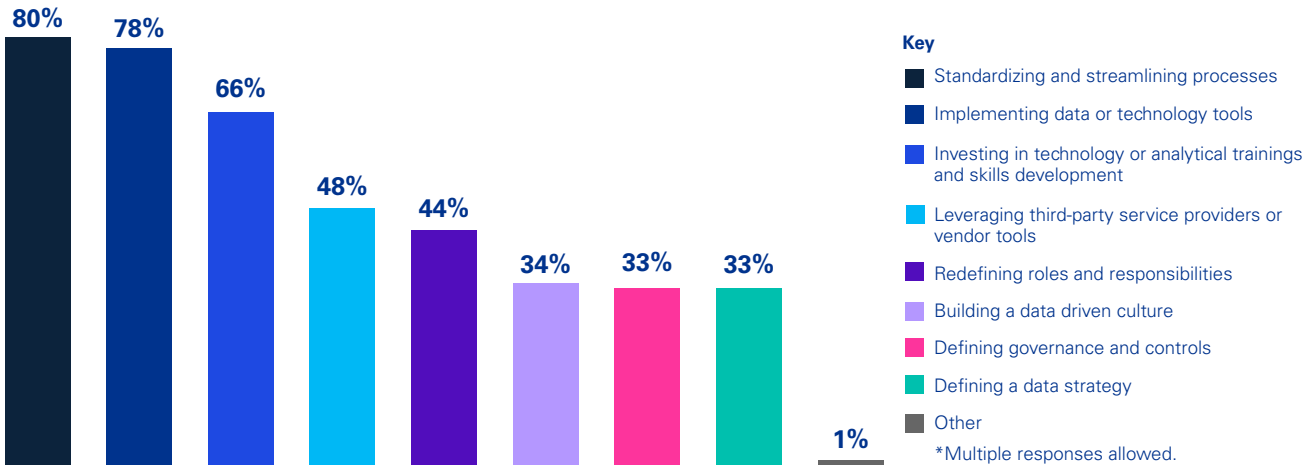
The external pressure for better and more frequent data is also pushing tax functions to a crisis point. Tax authorities are moving towards real-time tax reporting, requiring tax functions to be much more confident about their data. At the same time, stakeholders and investors are pushing for greater tax transparency as part of the ESG agenda (14 percent of energy sector tax functions say they already publicly disclose their tax information, and 32 percent say they plan to in the future).[5]

Perhaps not surprisingly, tax leaders say they will need to manage their data better if they want to operate effectively in the new normal. Almost eight-in-ten say they will require data management, extract, load and transformation (ETL) tools, and 60 percent say they need ERP, source systems and data warehouses to operate more effectively.[6]

The data also suggests that tax leaders are currently working to standardize their processes and implement new technology tools to lessen the burden of data management on their function.[7]

Over the next 18 months, the demand for data will become a clarion call for tax and business leaders in the oil and gas sector to invest in digital tax transformation.

Which of the following has your organization invested in to increase the focus on analytics and lessen the burden required on data management?



Source: KPMG, 2022 Chief Tax Officer Outlook

[5] KPMG, Global Tax Department Benchmarking: At-a-glance insights for energy, power and utilities sector tax leaders

[6] KPMG, 2022 Chief Tax Officer Outlook

[7] Ibid

Six Steps towards a data-driven tax function

1

Start with a standard data model
In our experience, sustainable transformation can't happen until the tax function has developed standardized, integrated processes and common data models — a way to organize data from many sources and formats into a standard structure and share it seamlessly between different systems, applications and resources. The good news is that various technologies can help tax functions solve data issues that hamper transformation efforts.

2

Capitalize on ERP upgrades
ERP investments are increasing as organizations work to comply with evolving financial reporting rules and requirements. A new ERP rollout or upgrade is an excellent chance for tax functions to optimize data and processes by adding clear tax specifications to work with the latest business systems. Meanwhile, prominent enterprise vendors are moving to cloud platforms, which creates additional opportunities for tax functions to access and integrate the data they need and design tax-sensitized solutions faster and cheaper.

3

Empower ESG with data and analytics (D&A)
Tax and ESG are converging, with corporations being asked to publicly share more information on their tax strategy and operating model, going beyond mandatory disclosure requirements. Predictive and scenario modeling enables enterprises to make decisions that align with the tax strategy while meeting calls for enhanced tax transparency and reporting under ESG. Next-level and real-time data analysis will enhance tax modeling and planning in this new, complex environment.

4

Embrace intelligent automation
As tax functions come under pressure to reduce costs, the focus of technology spending is shifting toward emerging technologies. Intelligent automation offers powerful benefits for tax functions facing new responsibilities and compliance demands, helping save time and costs and allowing tax professionals to focus on higher-level strategic activities. By embedding intelligent automation capabilities such as enhanced vision, speech, and language, tax functions can bridge gaps between systems and mimic manual steps executed by humans.

5

Explore managed services
Data management and transformation as a service is an emerging need in tax, specifically for virtual collaboration and operation of multinational companies in the global environment. This allows tax functions to unbundle different parts of processes, keeping only the most value-added data analysis activities in-house. Skilled tax professionals can then focus on what they were trained to do — analyzing data and deriving tax insights.

6

Transform with people in mind
Tax leaders should not underestimate the necessity of change in other areas of operations, including people, roles and responsibilities, culture, and service delivery. It comes down to this: More than a new tool or dashboard is needed to evolve the tax function into a more strategic business partner. Tax departments that are intentional, systematic and holistic in their approach to technology and data investments will see actual results.

The Power of technology and D&A enabled tax transformation

- Enhancing decision-making
- Adapting to changing business needs
- Keeping pace with regulatory change
- Enabling a holistic view of tax activities
- Optimizing costs
- Driving efficiency
- Streamlining processes
- Improving financial reporting accuracy
- Predicting and identifying problems

Overcoming the barriers

Securing investment capital and permission to redesign and transform the tax function is not easy and will take work. Tax and finance leaders will need to put significant effort into moving this up the investment agenda for the organization.

Start by focusing on small wins that demonstrate considerable value and lead towards a more digital tax operating model. This will partly come down to building the business case for investment. A business case should include quantifiable benefits (such as time savings, cost reduction and energy use), qualitative benefits (like scenario planning capabilities, better forecasting and more strategic advice to the business) and risk mitigation benefits (including financial risk, governance risk or reputational risk).

Education will also be critical. The tax function will need to understand the needs of the business and be able to align its investment requests to specific business outcomes. At the same time, the business will need to gain a greater appreciation for how a more strategic and digitized tax function can benefit the business.

Similarly, the tax and technology functions will also need to focus more on internal partnering, to smooth implementation and find opportunities for alignment on investment requests.

At the same time, the increasing dependence on data analytics tools and enterprise systems will require higher technical proficiency at all levels of the tax function. And organizations are competing to attract and retain a limited number of high-skilled tax professionals. One option is to increase the training and upskilling of current tax employees (an activity 58 percent of Chief Tax Officers say they are doing).[8] Another is to look to outsource or co-source some activities (45 percent of CTOs say they rely on outside tax advisers).[9]

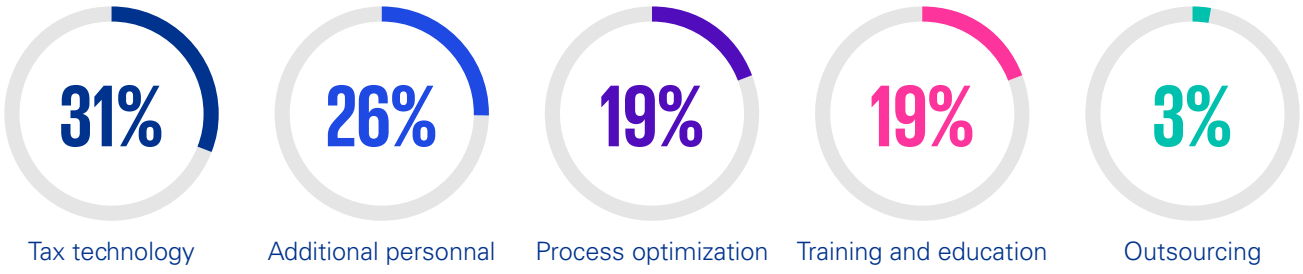
Ultimately, building your strategy around a clear vision for a digital tax function is key. If it aligns with the needs of the business and can deliver some quick wins, you should be able to build the right momentum to achieve a real and sustainable tax digital transformation.

Key takeaways

- Figure out your vision for tax
- Make sure you are aligned with the business and related functions
- Build momentum and ROI through quick wins
- Look for accelerators and internal partners
- Get support from transformation professionals.

Wishlist

Additional personnel and tax technology topped the list for tax leaders when asked where they would invest if they had an additional budget.



Source: KPMG Global Tax Benchmarking Survey 2021

[8] KPMG, 2022 Chief Tax Officer Outlook

[9] Ibid

How KPMG can help

As the world of tax has changed, so have KPMG firms' services, evolving for the modern complexities and challenges you face to become more multidisciplinary, technology-driven and collaborative. By taking the time to understand your unique business issues, KPMG Tax & Legal professionals can bring you targeted approaches and data-driven insights, engaging a variety of colleagues and service areas from KPMG firms around the world, and often drawing on the experience and knowledge of KPMG specialists in other areas of the organization, including audit and advisory. KPMG professionals are passionate about building trusting, long-lasting business relationships with you — delivering adaptable approaches to deliver the cross-border services that meet your business needs today while helping you transform for tomorrow. United by our values, governed by the KPMG Global Tax Principles, and driven by our purpose to inspire confidence and empower change.

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Customers, insights and loyalty

How to grow the downstream

By **Manas Majumdar**, Partner and National Leader — Oil & Gas, Chemicals, KPMG in India; **Paul Martin**, Chair Global Retail Steering Group & Head of Retail UK, KPMG in the UK; **Sushant Rabra**, Partner, Digital Advisory, KPMG in India; **Narmin Vasanji**, Prairies Management Consulting Geographic Leader, KPMG in Canada; **Eric Wesselman**, Partner, Head of Digital Transformation Advisory, KPMG in the Netherlands.

You know you need to diversify and grow your downstream business if you hope to survive and thrive past 2030. To do that, you need to know your customers. Here's how the leading oil and gas companies are transforming into customer-centric businesses.

Why do customers suddenly matter more?

The pressure on oil and gas companies to diversify away from upstream and midstream activities is undeniable.

Institutional investors and banks have been clear about their plans to reduce their exposure to the industry. Insurers are moving in the same direction (Munich Re recently announced they will no longer invest in or insure projects in the sector).[10] At the same time, governments and society are looking to the oil and gas sector to help lead the energy transition and the drive to Net Zero. Regulators are pushing for greater transparency around carbon impacts. And investors want to smooth the risk of price volatility.

There are good reasons for all the pressure. The reality is that changing customer demand and expectations are making the old oil and gas business models obsolete. Electric Vehicles sales volumes have skyrocketed, breaking the connection between consumers and gas stations. With little room for differentiation at the pumps, customers are moving to gas stations that also solve their need for convenience and value. Those offering retail, food and other adjacent services quickly capture market share.

Gone are the days when customers got to choose from three or four variants of gas and diesel. Today's customers have multiple options, from EV charging to biofuels to hydrogen (whether that be blue, green, turquoise or pink). Understanding and adapting to customer preferences is becoming critical.

The writing is on the wall. Oil and gas companies should evolve from the product-centric business models of the past to the customer-centric business models of the future. And to do that, they should develop a better understanding of their customers.

This can be a significant challenge for many integrated oil and gas companies. Many oil and gas execs come from the upstream side. Extracting and refining the molecule was always the main focus. The rest was more about smart supply chain planning and franchising. Understanding the end customer was not an upstream priority.

Now, however, they are being asked to focus on the downstream. They are facing pressure to develop and deploy new customer-centric business models. They are trying to improve the margins of existing downstream assets and partnerships. They are working to change their 'story' to investors. And they recognize that their ability to do all these hinges on reasonably sophisticated capabilities, customer insights and loyalty.

Suddenly, customers matter even more. And suddenly, many oil and gas companies realize they need to know who their customers are and what they want.

The customer IS the agenda

These are not easy times for oil and gas executives. The agenda is filled with Red Alert issues and topics that influence decision-making. Regulators and policymakers are becoming more active. ESG considerations are impacting the cost of capital. Shareholder activism is pushing different agendas.

Yet, at the root of each of these agendas is the customer. Regulators and policymakers are trying to protect the customer. Customer demand is helping drive the ESG agenda. Activist investors see themselves as giving retail investors a voice. Simply put, the customer is not just ON the agenda; the customer IS the agenda. Understanding the customer has never been more critical for the oil and gas sector.

[10] Munich RE, New Oil & Gas investment/underwriting guidelines, October 2022.

Who are you competing against?

Oil and gas companies will need to come up with some new models — and quickly. Just ten years ago, forecourts and gas stations were all about fuel. By 2030, we expect traditional carbon-based fuel will make up just 20 percent of a gas station's revenues.[11]

One avenue focuses on convenience. The idea here is to use the forecourt to offer customers the experiences, goods and services they need (whether or not they are fueling up). It's a massive expansion of the convenience store approach already being used in the UK, Canada, the US and other markets, to include things like luxury cafés, high-end restaurants, pharmacies and groceries. And more than just goods, adjacent services can be added, which open up new dimensions for attracting customers with everything from car maintenance, insurance/financial services and lockers to home delivery services, child play areas and even co-working space. Mobility options, charging stations and hubs would be available while you shop.

Our view suggests the forecourts of 2030 may see approximately 40 percent of their revenues flow from retail, food and beverage. We expect around 30 percent of from adjacent services and about 10 percent from mobility services. Fuel will likely make up just 20 percent — and that proportion will likely decline.[12]

Consider what that means in terms of your competition. When the forecourt was all about fuel, oil and gas companies had just a handful of real competitors in each market. For fuel, prices were adjusted in near real-time, but only quarterly or monthly on non-fuel items. Proximity and need were the main drivers of footfall. 'Distress' fuel purchases usually drove consumer visits.

Forecourts of the future will likely face very different competition. They may fight against retail businesses with deep customer insights, relationships and experience. These competitors know what their customers want and can adjust prices and inventory rapidly to respond. They compete based on convenience, purpose and experiences. Some may be physical competitors. More often, they will likely be digital and platform players.

Now consider what that will mean in terms of capabilities and strategic focus. The ability to extract and refine the molecule will continue to be necessary. But as that part of the business declines, what will become more important is the ability to understand, interact and serve customers. Simply put, the engineers should make room at the strategy table for the retail merchants. They will also need to transform their own thinking to put the customer first.

The idea here is to use the forecourt to offer customers the experiences, goods and services they need (whether or not they are fueling up). It's a massive expansion of the convenience store approach already being used in the UK, Canada, the US and other markets, to include things like luxury cafés, high-end restaurants, pharmacies and groceries.

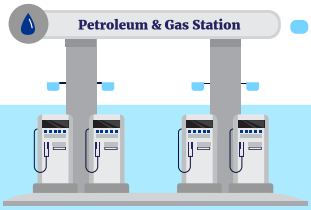
[11] Fuel Forecourt Retail Market, KPMG International, 2020

[12] Ibid

Evolution of forecourts

Forecourts' product and service offerings are continuously evolving, driven by customer demand for convenience — contribution of fuel retailing will continue to decline while non-fuel retail offerings will gain prominence

Convenience



Note: Home delivery trend made more prominent by rising logistics/delivery partnerships in light of COVID-19

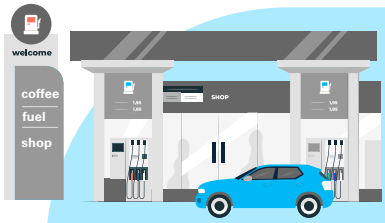
Forecourt in the past

Consumers' forecourt visits centred around **'distress' fuel purchase** — this dictated the design of **forecourts and the type of services offered**

Market Size (2015):
US$ 176 billion

Fuel 90%

Forecourt today



Convenience and 'to-go' culture has shifted the consumer demand towards retail shopping and adjacent services

Adjacent Services 10%
Car services (spare parts & repairs)

Market Size (2022):
US$ 224 billion

Fuel 50%

Retail & F&B 35%
- Fast-food outlets
- c-stores (groceries and other products)
- Liquid boost (cafes, soft drink kiosks)

Adjacent Services 15%
- Car services (spare parts and repairs)
- Pick-up point for packages
- Home delivery goods & services

Future forecourt (over 10–15 years)

Market Size (2030):
US$ 304 billion[1]

In the future, consumer demand for **convenience coupled with wider mobility and energy trends will enhance the role of services**

Convergence (Retail + adjacent services)

Fuel 20%

Retail & F&B 40%
- Fast-food outlets
- c-stores (groceries and other products)
- Liquid boost (cafes, soft drink kiosks)
- High-end restaurants
- Luxury cafes
- Checkout-free c-stores

Adjacent Services 30%
- Home delivery goods & services
- Car wash and repair
- Pick up point for packages
- Amazon lockers
- Co-working spaces
- Child play areas
- High-end restaurants
- Laundry services
- Pharmacy

Mobility 10%
- Charging points for electric and autonomous vehicles (EV/AV)
- Mobility hubs (EV/AV service stations)
- EV/AV accessories

Technology to have an over arching presence all across

Note: (1) KPMG forecast — busing univariate time series ARIMA model in R; the forecast is purely statistical and is based on historic time series trend; (2) The market size represents revenue derived from convenience sales only; forecourt retailers' sales of petrol and gas are excluded as per Euromonitor; (3) A trend made prominent by rising partnerships for logistics and delivery, in light of COVID-19
Source: KPMG Analysis

5 generations of customer loyalty

Oil and gas leaders already know that customer loyalty programs are a great way to capture customer data, build relationships, drive cross-selling and encourage loyalty. Most have been offering rewards or recognition programs for years.

The problem is that customer expectations of loyalty programs have changed dramatically. Loyalty programs have made generational leaps in just a matter of years. The older types of programs are now failing to interest customers. The value they deliver to oil and gas companies is diminishing. And players like Starbucks and WeChat have changed the rules and dynamics of what loyalty programs can provide.

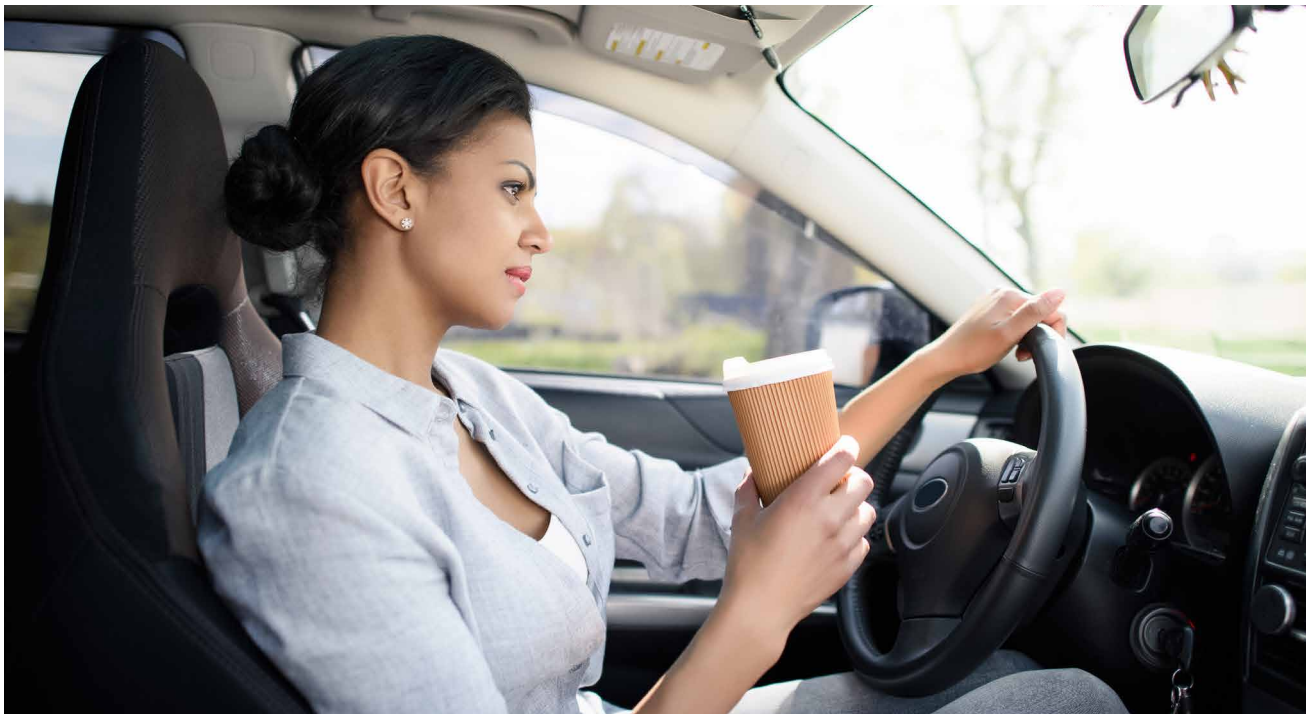
Most oil and gas loyalty programs are 1st Gen or perhaps 2nd Gen. They are generally point-based rewards cards where customers accumulate points through fuel purchases. They aren't usually redeemable for reduced fuel prices, but they tend to offer vouchers for discounted services like car washes. These plans can often enable some limited cross-selling and product bundling. But today's consumers want more than just reward points or vouchers.

The more sophisticated 3rd Gen program is more of an ecosystem play. Multi-brand and tier-based, these programs let members use one card across a group of retailers. That allows for better customer engagement. But these plans tend to be more expensive for retailers and often fail to deliver meaningful customer insights about each brand.

The likes of Barnes & Noble or some luxury retail brands epitomize the 4th Gen. Customers receive privileges based on their purchases and volumes — perhaps an invitation to an exclusive fashion showing or free shipping on all packages. These loyalty programs, Amazon Prime is an example that many would be familiar with, require that customers pay to join, providing the company with an upfront revenue stream. These schemes allow retailers to drive increased engagement through value, service and content ecosystems.

The most sophisticated loyalty systems today are best epitomized by WeChat and TenCent in China. These umbrella loyalty programs put everything a consumer needs under one roof, providing enhanced convenience alongside rewards. These platforms can offer integrated experiences between the online and offline channels, allowing retailers to track behavior across the ecosystem.

Oil and gas downstream players should carefully consider how they play and who they play within this new world of loyalty programs.



Four factors to a successful loyalty program

1. **Make it easy to use:** Globally, more than six out of 10 consumers agree that loyalty schemes are too hard to join and/or earning rewards is too tricky.[13]
2. **Be clear about your purpose:** Customers lose interest in schemes and programs that don't continue to deliver a clear value proposition to their lives.
3. **Build awareness:** More than one in three consumers who do not belong to any loyalty programs say it is because they are not aware of any.[14]
4. **Keep it fresh:** Around half of consumers strongly agree that companies should find new ways to reward loyal customers.

Five generations of customer loyalty

Generation 1

- Traditional, old school loyalty program
- **Point-based rewards** that one could select from
- Entry and point accumulation based on purchases

Generation 2

- Rewards from points extended to include discounts on purchase (e.g. on fuel price)
- Also **offer vouchers** for additional services (e.g. car wash)
- Introduced **product bundling & cross — selling** offers (e.g. lubes with gas)

Generation 3

- Becomes **aneco-system play** — one loyalty card provides access to group of retailers
- Opens up program to be **multi-brand**
- Tier-based points program for more targeted customer engagement

Generation 4

- Rewards based on purchases & volumes
- Rewards include **privileges/ experiences** (e.g. access to fashion event, exclusive holiday)
- Becoming **paid programs** — where there is upfront revenue stream for better discounts/ shipping etc.

Generation 5

- Evolving into **umbrella loyalty programs**, covering all consumer needs in one roof
- Provide integrated customer experience **across offline & online** channels allowing 300 tracking of buying behaviour
- Many examples from growth markets like WeChat, Tencent in China, Tata Neu in India

[13] 2019 Customer loyalty report, KPMG International, 2019

[14] Ibid

Loyalty to data to insights to value

Customer loyalty isn't just about getting closer to the customer and increasing stickiness through repeat visits and friend-and-family recommendations. But increasingly, it is about customizing for the customer and creating value by building trust, enabling personalized experiences and — perhaps most importantly — developing customer insights to engage customers profoundly. It's these insights that are driving solid margins for retailers and helping them grow their share of the customer wallet. And it's these insights that oil and gas companies will need to compete with new downstream business models.

Consider this: Retail giants are believed to change their prices millions of times a day. The average oil major does about 650 price changes per year. This allows retailers to maximize margins in near real time. But they can only do this because they have profound insight into what their customers want, what they are willing to spend and what value they are looking for. They know when a customer makes a distressed purchase and can play with price elasticity. And they know when a customer is just looking for the lowest price.

Loyalty programs create the data. The data holds insights. The insights deliver value — for the customer and the shareholders. Yet the route from loyalty program to value is not straight. Oil and gas companies will need to overcome significant barriers and create new capabilities to navigate that journey.

Let's start with the data. Today, most customer data that oil and gas companies hold is stuck in siloes. Those with a mix of corporate and franchisee-owned locations face particular challenges integrating and correlating their data. To unlock the loyalty program's value, oil and gas companies should significantly mature their data collection and integration capabilities.

Technology is also a challenge. Older POS systems at forecourts limit the amount of information that can be captured. Outdated analytics capabilities mean that the most valuable insights remain locked away in the data. Customer voice technologies are rarely used. You need the right tech stack to run a slick 3rd or 4th Gen loyalty program.

Undoubtedly, the cost of undertaking this type of data and technology transformation is high. We know of oil majors who plan to invest tens of billions of dollars into upgrading their technology stack over the next decade. Others are looking at how they might partner with existing leaders to help accelerate their progress at a more reasonable cost.

Don't underestimate the value

Customer insights can deliver value to oil and gas companies in many ways. We've already talked about how insights can help inform business model development, shore up margins and drive customer experiences. Think a bit bigger, and you can quickly see how customer insights can help oil and gas companies deal with significant strategic shifts like the energy transition.

Customer insights will likely be vital to forecasting the shift from hydrocarbons to electrons. They underpin the business case for new investments. They inform decision-making around diversification into new sources of energy and new distribution models. And they will likely be critical to ensuring that your company will remain relevant to your customers as the energy transformation evolves.

From ambition to activation

You are committed to growing your downstream business. And you have a good idea of what you want to be in the future. But getting from ambition to activation can be challenging.

It will take careful thinking to navigate the options and possibilities. Instead of building your own retail capabilities, you could partner with an existing retail leader (or buy one). Your retail partner may already have a robust loyalty program and customer-centric capabilities. They may also have a world-class technology stack.

Similar decisions should be made around what processes should be automated, what can be outsourced and what should be kept in-house. However, these decisions should be made within the context of each business. Those with sizeable franchise networks may need help to build a new system that works for multiple stakeholders; partnering to secure a more agile technology platform may be the key. Those with customer loyalty programs or c-stores may want to consider the value of their existing sunk costs and capabilities. Understanding what to build yourself, what you can gain from partnering and what you purchase may be vital to building your roadmap.

Ultimately, this is about securing the right capabilities to envision and execute against your ambition. And our view suggests that moving from ambition to activation will require maturity in eight connected capabilities.

These are cross-functional and apply across the operating model. Our data suggests companies investing in these are twice as likely to see an overall impact from their investments.

Each of the eight enabling capabilities is underpinned by a set of five sub-capabilities. The first step in defining a winning model is understanding your relative maturity in each sub-capability against the required maturity to deliver your winning business model. In other words, start with a sober self-assessment of the strength of your capabilities across these eight areas. Then begin to think about how you bridge the gap between where you are and where you want to be.

The bottom line is that the world has changed. Oil and gas companies have no choice but to transform and diversify. But to achieve that, they will need to gain a much better understanding of their customers.

Key takeaways

1. Customer-centricity is key to oil and gas company survival.
2. Yet competition for the customer is tight, and expectations are high.
3. Loyalty programs can provide important customer insights.
4. Oil and gas companies will need to radically rethink their downstream models and capabilities and focus on creating value from customer programs.
5. This will require a much more connected enterprise and ecosystem of partners.

How KPMG can help

Digital disruption and rising customer expectations create unforgiving markets where loyalty is hard-won and easily lost. If you can't deliver what your customers want, when and where they want it, they will go to someone who can. But there is no point in creating a breakthrough customer experience if the new business model runs at a loss. KPMG teams offer services that can help you achieve profitable, sustainable growth through customer-centric thinking. This is all about getting close to your customers and staying there. KPMG firms are committed to helping drive the Oil & Gas industry forward — no matter how complex the challenge — to create enormous value for shareholders and society.

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Manas Majumdar leads the Oil and Gas and Chemicals practice in India, primarily anchored in strategy and transformation work in this space. His recent focus has been on digital transformation and how to leverage digital technology to grow across markets and build efficient operations. In addition, he has supported both government and private sector clients in areas such as market reform and preparedness, strategic growth plans and product-market strategy, business restructuring, operations performance improvement, cost optimization and supply chain transformation.

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Eric is a partner at KPMG in the Netherlands and is responsible for our Digital Transformation Advisory practice in the Netherlands. Eric supports our clients with the innovation of their business models, the digital transformation of their organization and the supporting processes. He supports our clients in designing their Digital Strategy and IT Strategy, executing their digital journey management and orchestrating their digital enabling ecosystems. Cloud, IoT, Data & Analytics, Mobile Apps, Blockchain, and Robotics are among the technologies Eric and his team apply to help our clients transform and future-proof their digital businesses.

Data, digital and technology transformation

The combination of talent and technology leads to a greater ability to provide excellent customer service, improve operational efficiency, and gain a competitive advantage. Undoubtedly, digital transformation should lead to positive outcomes, whether streamlining processes, harnessing data, or forming entirely new ways to do business. This is about uniting every piece of the enterprise for a common goal.

Businesses today can face uncertainty with confidence thanks to digital transformation triumphs. Today, customer-centric technology strategies are considered vital survival tools for businesses due to the performance improvements they have achieved to date.

With a global network of over 14,000 data and technology professionals — including leading data scientists and engineers — member firms can leverage the latest KPMG data, analytics, intelligent automation and artificial intelligence technologies to build and deliver customized business solutions for clients.

KPMG has strategic relationships across the emerging technology landscape — including Microsoft, Oracle, IBM Watson and Google. We co-innovate with our alliances to build leading technology solutions, helping amplify the value and capabilities member firms provide to clients.

Trust underpins our approach to data, digital, and emerging technologies. KPMG professionals can help you take advantage of the opportunities created by new technologies through proactive governance models, transparency and controls. As a result of our expertise in assessing and solving clients' most pressing business challenges, KPMG is consistently identified as a leader in various key analyst reports.

KPMG recognized as a Forrester Wave Leader in Customer Experience Strategy Consulting

"KPMG has a robust approach to employee CX training, offering a formal academy that provides learning opportunities through different modes and that can integrate with its clients' learning management systems. The firm accelerates clients' culture change efforts through hands-on behavioral coaching for executives, and it uses multiple methods to influence employee behavior — including rewards and recognition programs. KPMG continues the culture transformation with its strong library of assets to align the ecosystem, including pre-built target operating models — some of which are sector-specific."

Source: The Forrester Wave™: Customer Experience Strategy Consulting Practices, Q4 2022

KPMG brand and risk consulting services received top score by clients and prospects.

KPMG ranked number one for 'current brand score' among risk advisory firms and for the quality of our Security services. KPMG received the highest score of the 16 vendors evaluated in this category — a high achievement determined by clients and prospects alone. This ranking is based on mindshare, our level of credibility, authority, and competitive resilience — and topping this ranking recognizes our brand as the strongest in clients' minds today.

Based on 300 responses to a survey of senior clients of consulting firms and featured in Perceptions of Risk Firms in 2021 published by Source Global Search.

Click here for more information about KPMG's capabilities and innovation by leading analyst firms.

KPMG's Global Energy Institute

The KPMG Global Energy Institute (GEI), launched online in 2007, is a worldwide knowledge-sharing platform detailing insight into current issues and emerging trends within the Power & Utilities and Oil & Gas industries. The GEI helps to shed light on key topics ranging from upstream volatility, midstream constraints, industry consolidation, shifting customer demands and new technologies, alternative and renewable energy, smart grid technology and transformation, evolving regulatory and statutory requirements, and financial reporting and tax updates.

The GEI interacts with its over 40,000 members through various channels, including webcasts, publications and white papers, podcasts, events, and quarterly newsletters. The institute works together with member firm clients, external partners and the global KPMG network of energy experts in analyzing some of the most pressing challenges facing the industry. It also develops practical solutions for an increasingly complex energy environment.

A complimentary GEI membership is an effective way for energy executives to gather the latest information on industry trends and help meet their continuing education requirements. Members receive early alerts and invitations to thought leadership, studies, events, and webcasts about key industry topics.

To receive timely updates and insights relevant to the oil and gas industry, become a KPMG Global Energy Institute member today by visiting kpmg.com/energy.

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