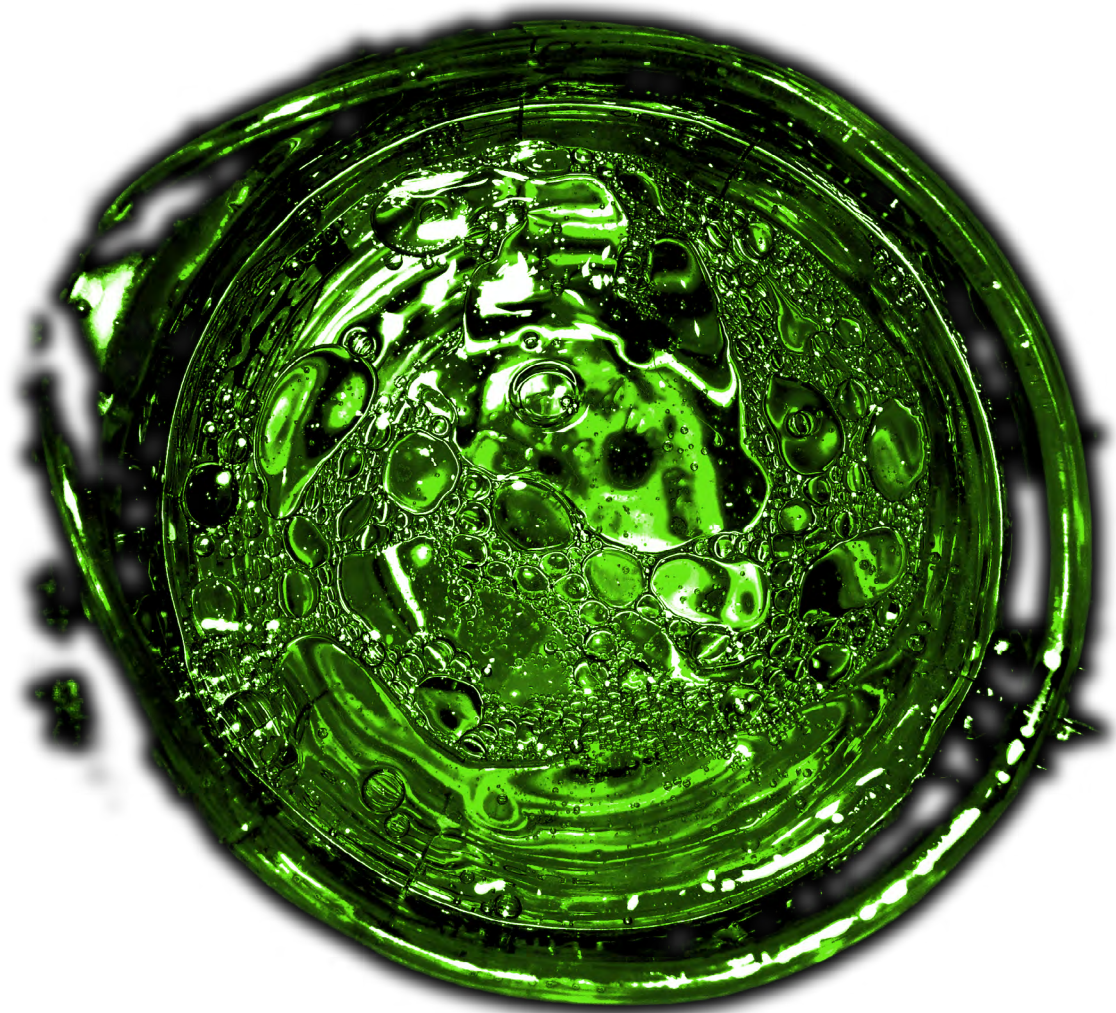# Deloitte.

Digital maturity assessment
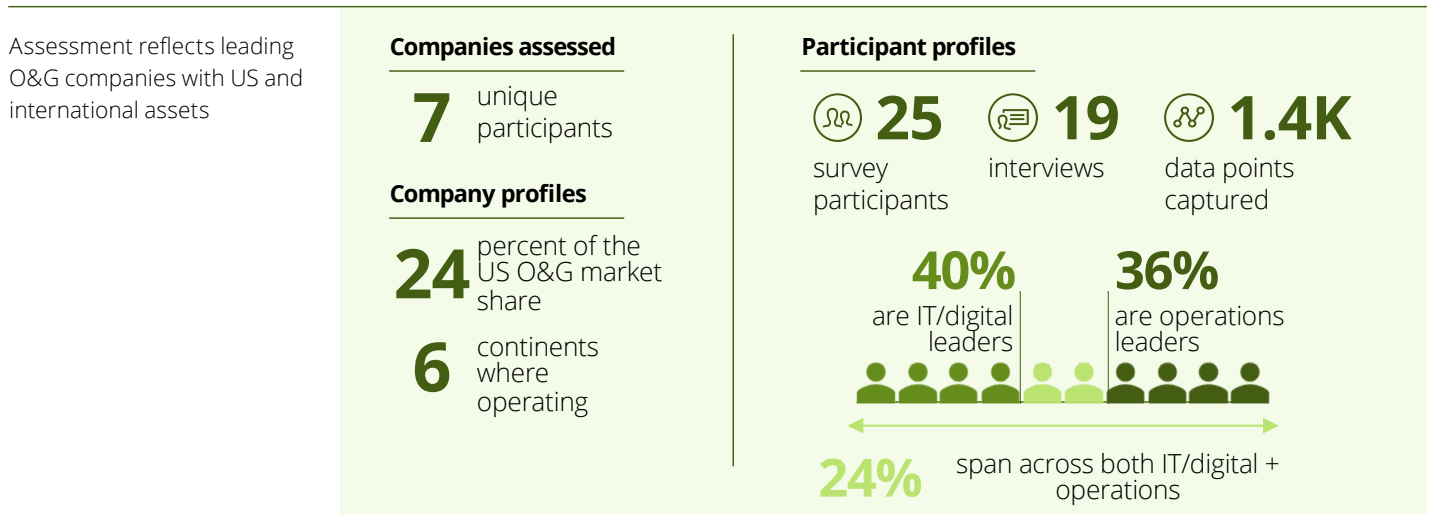for oil and gas companies

Since 2017, oil and gas companies have been deeply engaged in a phase of digital evolution, but they seem to have reached a standstill. What is preventing these companies from advancing in their digital transformation journey?

Currently, oil and gas (O&G) companies are in the midst of a significant digital evolution. Initiated in 2017, this digital transformation wave has permeated all business sectors, from exploration to refining and marketing. This shift, accelerated by global events such as the COVID-19 pandemic, underscores the need for companies in this sector to adapt and innovate.

However, many O&G companies appear to have plateaued in their digital journey. To uncover the reasons behind this stagnation, we conducted a comprehensive survey involving key stakeholders in operational, digital, and information technology (IT) roles at O&G companies across the value chain. The objective was to gauge their digital maturity, identify industry standards, and highlight avenues for enhancing digital value realization.

Our survey results unveiled a set of challenges that seem to be hindering the progression of these companies. Key roadblocks include the absence of a unified digital strategy, internal resistance to change, IT and operational technology (OT) convergence, cybersecurity issues, and financial constraints. These findings emphasize the necessity for O&G companies to reassess and readjust their digital strategies to overcome these obstacles and continue on their path of digital evolution.

Figure 1. Participating peer group

Assessment reflects leading O&G companies with US and international assets

Companies assessed

7 unique participants

Company profiles

24 percent of the US O&G market share

6 continents where operating

Participant profiles

25 survey participants

19 interviews

1.4K data points captured

40% are IT/digital leaders

36% are operations leaders

24% span across both IT/digital + operations

Six key themes emerge

1. Defining and tracking digital value is key

Defining and tracking digital value is vital in a digital transformation journey. In our previous assessment, participants identified the challenge of defining digital value upfront. Currently, the potential and value of digital transformation, from operational streamlining to improved customer experiences, is acknowledged by businesses. However, without an effective corporate governance framework and a clear understanding of digital value drivers, accurately quantifying this value can be challenging. A consistent and comprehensive framework is crucial to justify digital transformation investments and assess the success of digital initiatives.

To establish this framework, a thorough understanding of the business's digital portfolio and its enterprisewide value is needed. Beyond traditional return-on-investment measures, the framework should include intangible benefits like increased employee engagement, improved interdivisional collaboration, and enhanced customer perceptions. Agreeing on a value framework and measures, and diligently tracking these across the organization, is necessary. Despite the challenges, this process is vital as it makes the unseen digital value visible, encouraging data-backed, bolder digital investments.

2. IT and OT convergence gains momentum

The progression of IT and OT (the hardware and software that monitor and control devices, processes, and infrastructure) convergence offers immense value through integration, which can enhance operational efficiency and data analysis, and create a more connected business environment. Recognizing this, many organizations are developing a framework to centralize this convergence in their operations.

However, the path to full IT and OT integration brings challenges, particularly in cybersecurity. As these realms converge, organizations face an expanded threat landscape requiring new strategies. There is serious consideration toward addressing these security issues, with protective measures for critical infrastructure being implemented. Despite progress, there is an understanding that significant work remains, especially when the implications of engineering technology (ET) are also considered. The journey toward full IT and OT convergence is advancing, but through focus and investment, businesses can navigate challenges and unlock the full integration value.

3. Execution remains an issue

While in our previous assessment, participants lacked digital strategies, we now see execution as a key issue in the industry's digital journey. The ongoing process of digital transformation and establishing a digital operating model poses execution challenges for many organizations, largely due to the industry's immature digital state. While the benefits of digital transformation are understood, the practical application of these changes is complex, particularly when integrating new technologies with existing systems, transitioning work processes, and managing resistance to change.

Deciding which digital initiatives to prioritize is another significant issue. The array of potential digital investments can be overwhelming, especially for organizations at the start of their digital journey. Factors such as lack of a clear strategy, limited resources, and a rapidly changing tech landscape complicate matters. A robust digital strategy is needed—one that identifies impactful initiatives and provides a clear execution path. Additionally, a structured digital operating model that ensures alignment between strategy and execution, with clear business goals and fundamental elements such as change management. Despite difficulties, the digital operating model's ongoing evolution is crucial for achieving digital maturity.

4. Close collaboration between business and IT is critical

Close collaboration between the business and IT is pivotal for driving digital transformation. Leaders in this field understand the value of this partnership. Consistent collaboration between the two helps to ensure strategic and operational alignment, breaks down silos, improves communication, and aligns digital initiatives with business goals. This fosters a shared understanding of objectives and a culture of joint responsibility for digital project success.

Moreover, this collaboration can spur innovation and hasten digital transformation. When the business and IT work together, they can effectively leverage technology to address business issues and create value. They can collectively spot digital improvement opportunities, make informed decisions on digital investments, and smoothly implement digital initiatives. However, cultivating this collaboration demands a cultural shift and robust leadership commitment. Despite the challenges, organizations bridging the business–IT gap are better equipped to navigate their digital transformation journey and tap into its full potential.

5. Change management continues to be a pivotal factor

Change management is crucial for the success of digital transformation efforts, remaining as one of the main independents since our last survey. A comprehensive change management plan is increasingly recognized as essential to enhance digital fluency within organizations, not only involving new technology implementation but also fostering a digital mindset among employees. However, many organizations struggle with slow adoption rates, often due to lack of a strong leader-led push for digital transformation.

Promoting digital adoption is challenging, often due to a lack of transparency and clear communication of the digital strategy. If employees do not understand the digital vision and its benefits, they might hesitate to adopt new technologies and work methods. This emphasizes the need for leaders to effectively communicate the digital strategy and its organizational and personal value. Leaders must also cultivate an open, inclusive culture where employees are encouraged to share their concerns and suggestions about digital transformation. With clear communication and strong leadership, organizations can overcome resistance to change and accelerate their digital transformation journey.

6. Unlocking value through AI/GenAI

AI/GenAI in the Oil & Gas industry is in its early stages. The industry shows keen interest in Generative AI due to its potential to revolutionize operations, boost efficiencies, and stimulate growth. Yet, AI adoption in this sector is still in its infancy. The industry seeks a compelling use case to showcase AI's value and justify resource and funding investment. Such a use case could serve as a catalyst for AI adoption, providing a clear implementation roadmap and a tangible demonstration of its potential benefits.
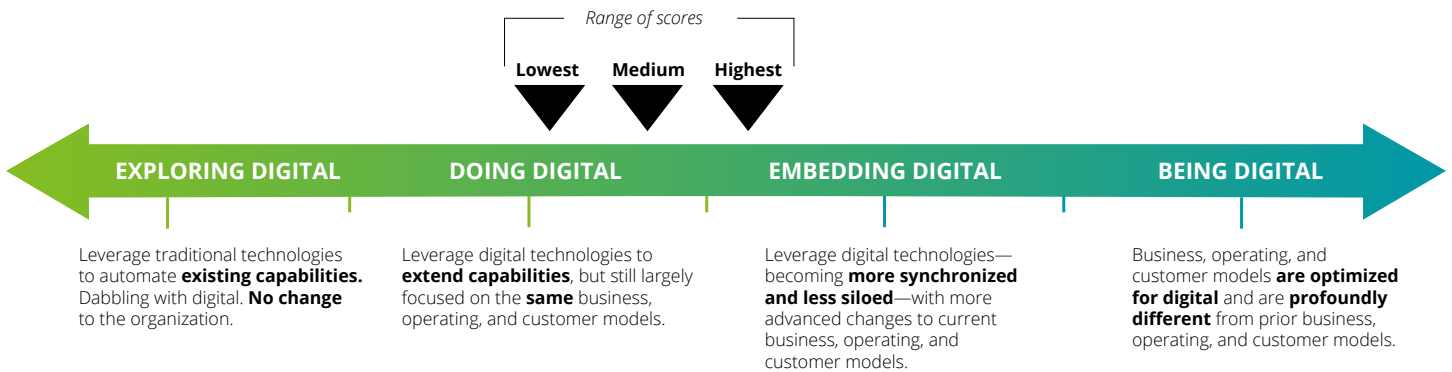
However, security is a critical consideration when deciding to implement specific AI tools. Due to the sensitive nature of data in the Oil & Gas industry and the risks of data breaches, companies are rightfully cautious. They're examining potential vulnerabilities associated with the usage of AI tools, and they are pursuing robust security measures to mitigate these risks. Therefore, AI development and implementation in the industry must be coupled with strong cybersecurity strategies. Balancing innovation and security will be critical as the industry progresses toward digital transformation.

Assessing oil and gas companies' digital maturity

Where do today's O&G companies stand across the digital maturity spectrum? Deloitte's online digital assessment tool can help determine a company's relative position along the spectrum and among industry peers, and identify improvement opportunities across four categories. The following figure illustrates the distribution of participants across the digital maturity spectrum. Most participants are clustered between the stages of "doing digital" and "embedding digital," indicating potential for further growth within the industry. Although, at first glance, participants seem to fall within a narrow band on the digital maturity spectrum, on closer inspection each participant has its unique focus based on its individual strategy, and variations become evident across the four main categories: digital strategy and operating model; digital culture, talent, and organization; operations and supply chain; and technology, data, and Infrastructure. Proceed further to gain insights into the best practices for each category.

Deloitte's maturity assessment scores are derived across four categories:

Figure 2. Digital maturity spectrum

Range of scores

| Lowest | Medium | Highest |

▼ ▼ ▼

| EXPLORING DIGITAL | DOING DIGITAL | EMBEDDING DIGITAL | BEING DIGITAL |

Leverage traditional technologies to automate **existing capabilities.** Dabbling with digital. **No change** to the organization.

Leverage digital technologies to **extend capabilities**, but still largely focused on the **same** business, operating, and customer models.

Leverage digital technologies— becoming **more synchronized and less siloed**—with more advanced changes to current business, operating, and customer models.

Business, operating, and customer models **are optimized for digital** and are **profoundly different** from prior business, operating, and customer models.

1. Digital strategy and operating model

Does the digital strategy align with business strategy across functions and business units? To what extent does the organization reassess and reprioritize digital projects to achieve continuous value?

Based on our cross-industry assessment, we've found that leading O&G companies:

- Have a clear alignment between digital and business leaders. The most successful companies ensured a strong partnership between the digital and business leaders from strategy to execution. Most rely on a digital roadmap to direct where they need to focus digital efforts that ensure alignment to business needs and deliver tangible results.

- Possess a centralized team formed by key business leaders and digital leaders that focus exclusively on digital initiatives. Companies that are leading the digital transformation have a formal chief digital officer or similar digital lead role.

- Have a clear understanding of digital and its vision across the organization.

- Create an agile mindset in the ways of working inside the organization by executing initiatives through agile digital teams with a "fail fast" approach.

- Communicate efficiently the value of digital in their organization, along with a value governance framework with consistent metrics for digital initiatives, which allows for transparency and identification of top value opportunities. They have visibility into the progress made, so they can easily stop or change direction as needed.

- Know how to make a strategic trade-off decision of when to buy vs. build, considering goals, resources needed, and solutions available.

- Form a centralized innovation committee with a structured framework to enable decision-making and encourage innovative ideas across the organization.

2. Digital culture, talent, and organization

To what extent has the organization fostered a digital mindset to empower innovation and experimentation? How does it incorporate and embed digital talent and skill sets?

Leading oil and gas companies:

- Create consistent digital fluency in their workforce, not only for IT employees but for the entire organization to have a basic understanding of digital.

- Empower individuals through training and culture to foster organic innovation.

- Have shifted recruiting focus to individuals with core digital skills as companies see the importance of technical skills in advancing their digital transformation.

- Embrace key leaders that understand digital and can advocate its value to the rest of the organization, to have strong leader-led change.

- Have successful "case for change" messaging that persuades employees in the digital transformation, creating higher level of engagement.

- Take in digital as a key piece of their operation, rather than looking at digital in a siloed approach.

- Have a strong collaborative culture between the business and digital team, with both functions understanding and sharing ownership in their digital transformation journey.

3. Operations and value chain

How does the organization integrate digital tools into planning and operations of key processes, leading to operational function optimization, improved safety, and efficiencies across the business?

Leading oil and gas companies:

- Embrace the importance of IT/OT convergence, which is the merging of data management systems (IT) and industrial operation systems (OT). This convergence aids industries in enhancing their decision-making and operational procedures, based on precise and up-to-date data.

- Acknowledge the transformative potential of digital technology in streamlining their operational efficiency and value chain management and have initiated the development of suitable digital tools to augment these endeavors.

- Recognize the importance of various digital tools including AI for predictive maintenance, safety software, data analytics for insights, Internet of Things (IoT) for operational control, and digital platforms for real-time coordination—all improving operational efficiency and safety.

- Are eager to integrate digital technologies in forecasting models. These tools—including AI, machine learning, and data analytics—enhance prediction accuracy and detail, improve decision-making and operations, and allow quick adjustments to forecasts as new data arises.

- With a service arm understand the value their products offer to their clients. They continually innovate, keeping up with new trends and technologies, to satisfy clients' needs and remain competitive.

- Have effectively monetized their digital initiatives for clients by identifying their unique needs and offering tailored digital solutions.

- Incorporate their value chain in their strategies to identify maximum value-generating areas. This involves understanding each chain link, pinpointing inefficiencies, optimizing processes, and making strategic decisions, leading to operational efficiency, customer satisfaction, and increased profitability.

4. Technology, data, and infrastructure

How connected and advanced is the digital infrastructure, and to what extent are data and analytical tools used to make better business decisions?

Leading oil and gas companies

- Take a careful approach, considering the best tools aligned with their business goals before investing time and resources.

- Are exploring AI/GenAI tools as a facilitator to enhance efficiency in various support value chain functions, including supply chain, finance, HR, and more.

- Have successfully implemented and evaluated the value of digital twins within their organizations. These digital solutions have demonstrated significant value, including improved operations, reduced defects, faster time to market, and the creation of new business models to drive revenue.

- Have mitigated data governance and cybersecurity risks by investing in platforms, enhancing security, and preventing potential threats.

- Recognize the significance of their robust datasets and have accordingly cleaned, prepared, and established proper governance around the data to extract optimal value. These companies, having a clear strategy on the best use of their data, can derive considerable value from their datasets.

- Have deployed digital in the field, increasing fluency in employees and automation in processes without losing talent and expertise.

Figure 3. Digital maturity assessment results* by capability
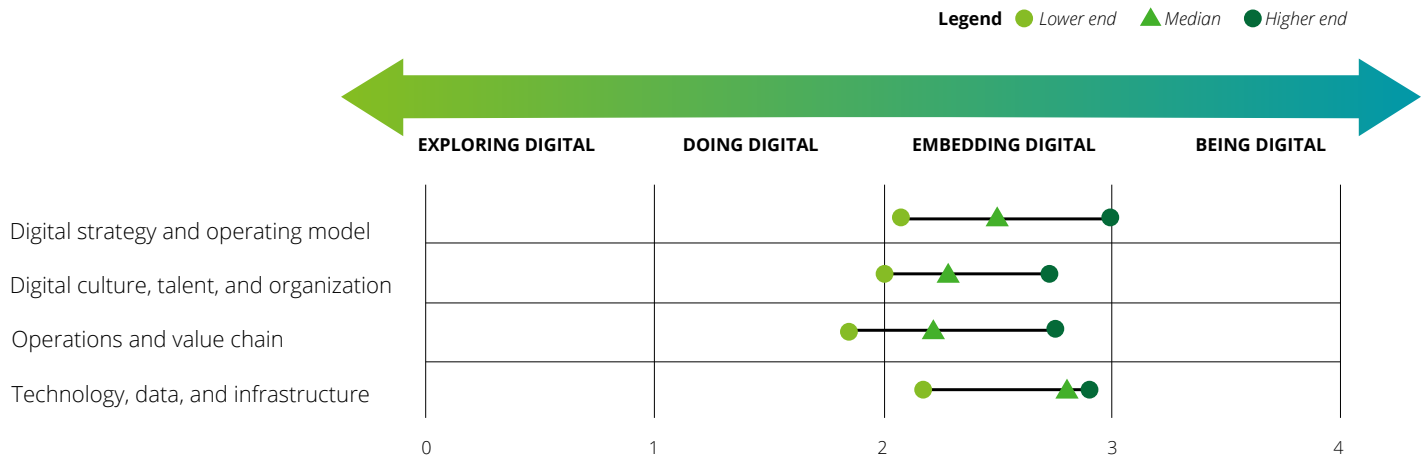
* The digital maturity score aggregates survey responses, Deloitte research, and company interviews.

Onward in our journey

Overall digital maturity benchmark results indicate that oil and gas companies are embracing the digital journey. The current phase of digital evolution that oil and gas companies are undergoing presents significant opportunities for them to innovate, improve operational efficiency, make data-driven decisions, and enhance stakeholder experiences. However, it is crucial for these companies to strategically navigate this digital transformation journey, leveraging the right technologies and prioritizing safety and sustainability alongside efficiency and profitability.

Interested in finding what those focus areas should be for your organization?

Contact Deloitte to access our assessment tool and find out where your organization is in its digital journey.

Take our survey to participate in the digital maturity assessment survey and join us in this transformative journey.

Nate Clark
Principal
Deloitte Consulting LLP
naclark@deloitte.com

Samrat Das
Managing Director
Deloitte Consulting LLP
samratdas7@deloitte.com

Special thanks to the following team members from Deloitte Consulting LLP for their contributions to this article: Beatriz Aguirre, Chikere Ogbonnaya, Nick Khater, and Shubham Singh.

Deloitte.