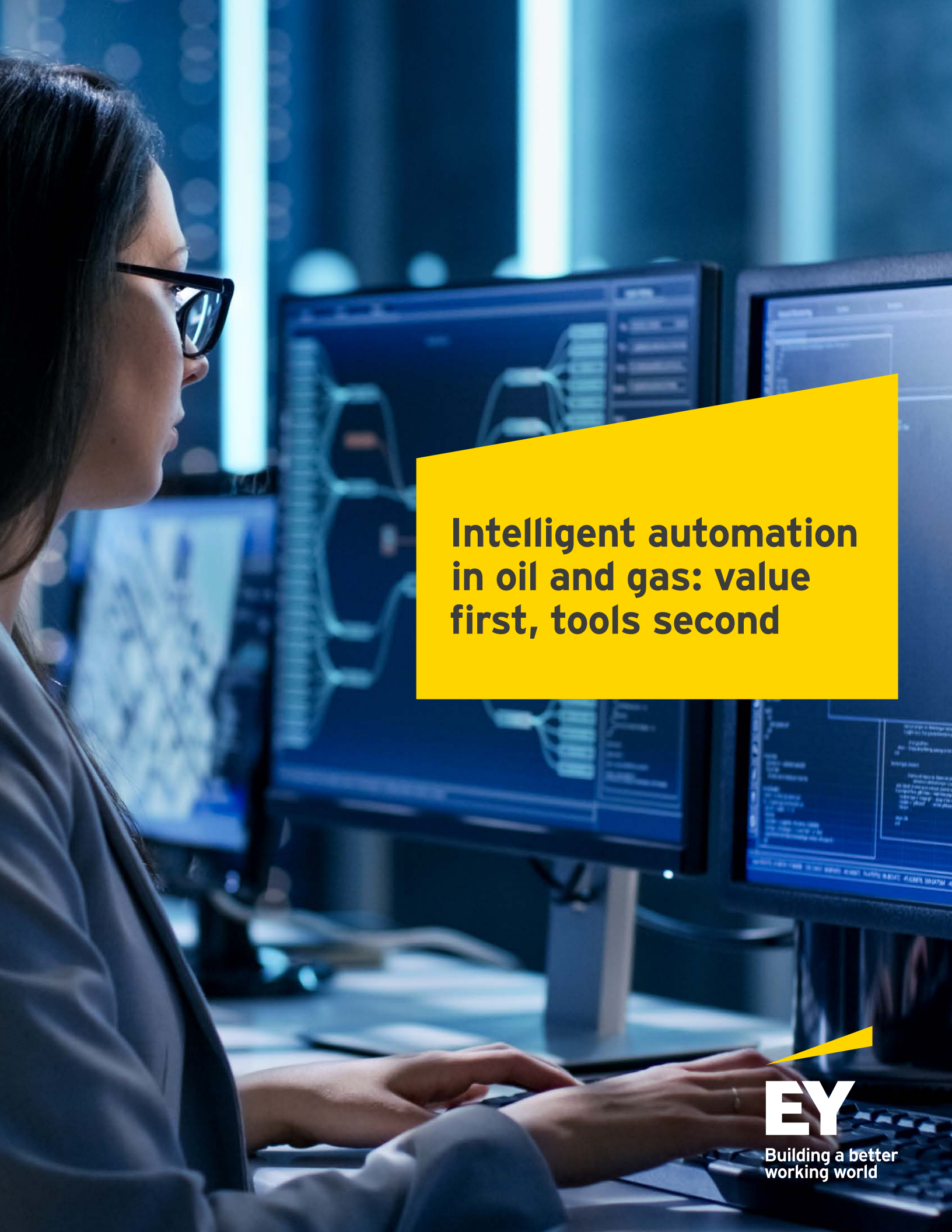
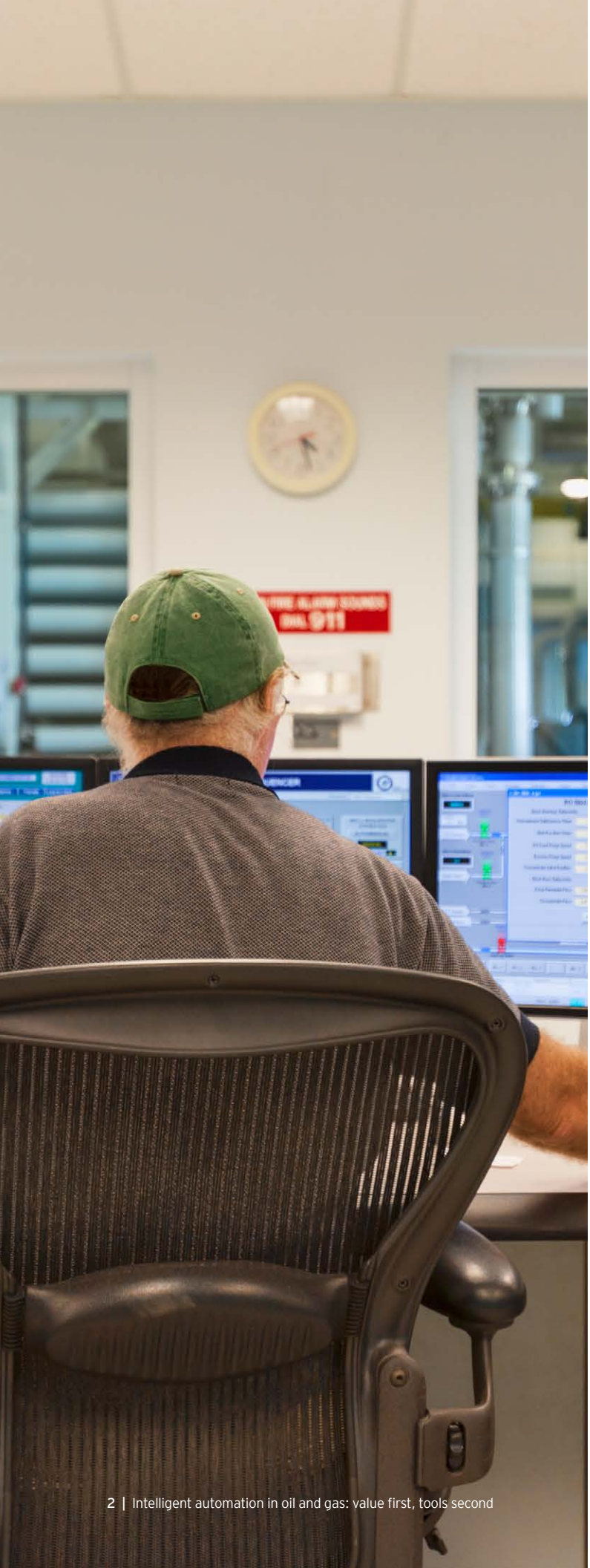


Intelligent automation in oil and gas: value first, tools second

EY
Building a better working world



Much of the current discussion around the digital transformation of oil and gas is focused on "what" and "how" — the specific technology available and the tasks that technology performs. It is no surprise why. Emerging technologies such as artificial intelligence (AI), robotic process automation (RPA) and the Industrial Internet of Things (IIoT) are not widely deployed in the industry, and many companies are still trying to determine what is necessary and what isn't.

This attention on specific technologies overlooks a critical element in the digital revolution — the workforce, both digital and human, needed to integrate, manage and work alongside these new tools. In the digital transformation, the "who" is just as critical as the "how."

Intelligent automation is not simply the deployment of digital tools; it represents a new way of thinking that allows companies to constantly discover, learn, change and grow as they strive to meet business objectives. Intelligent automation is the smart combination of skilled people and digital workers to capture the full benefits of emerging technologies.

The digital-human combination

Intelligent automation is a free-flowing, ongoing process that brings together the best in a wide range of technologies: social, mobile, analytics, cloud computing and intelligence-driven automation, and integrates them with each other and with the human workforce to deliver value across the enterprise. A traditional IT program implementation might follow one process: choose a vendor, buy the tools, cascade the rollout. Intelligent automation requires a different way of thinking, because it is a business strategy, not a piece of software.

To better understand how intelligent automation can benefit the organization, it helps to humanize digital "employees" and categorize them by skillset. There are four main categories:

Digital Thinkers: mathematical validations, predictive analytics and big data

Artificial intelligence and neural networks produce vast amounts of data and make decisions faster and more accurately than humans. Digital thinkers are constantly analyzing big data to find the answers to questions such as: what specific piece of equipment is showing signs of wear and should be replaced? What sort of predictive maintenance can be leveraged? What is the most effective fracking approach for this well? Deploying these technologies will enable employees to anticipate issues and respond rapidly to changing conditions.

Digital Talkers: communication-based tools, such as chatbots

Today, a field worker checking on wells has to write down the location of leaks or other issues, drive back to the trailer, log into the system and enter the data properly. In a digital world, the worker will simply tell their smart device, which automatically knows the location and the type of equipment involved, and the chatbot will send the information to the RPA software to create a work order. The worker will never have to write anything on paper or put fingers on a keyboard, thus reducing the risk of incorrect data transfer and the time needed to manage issues.

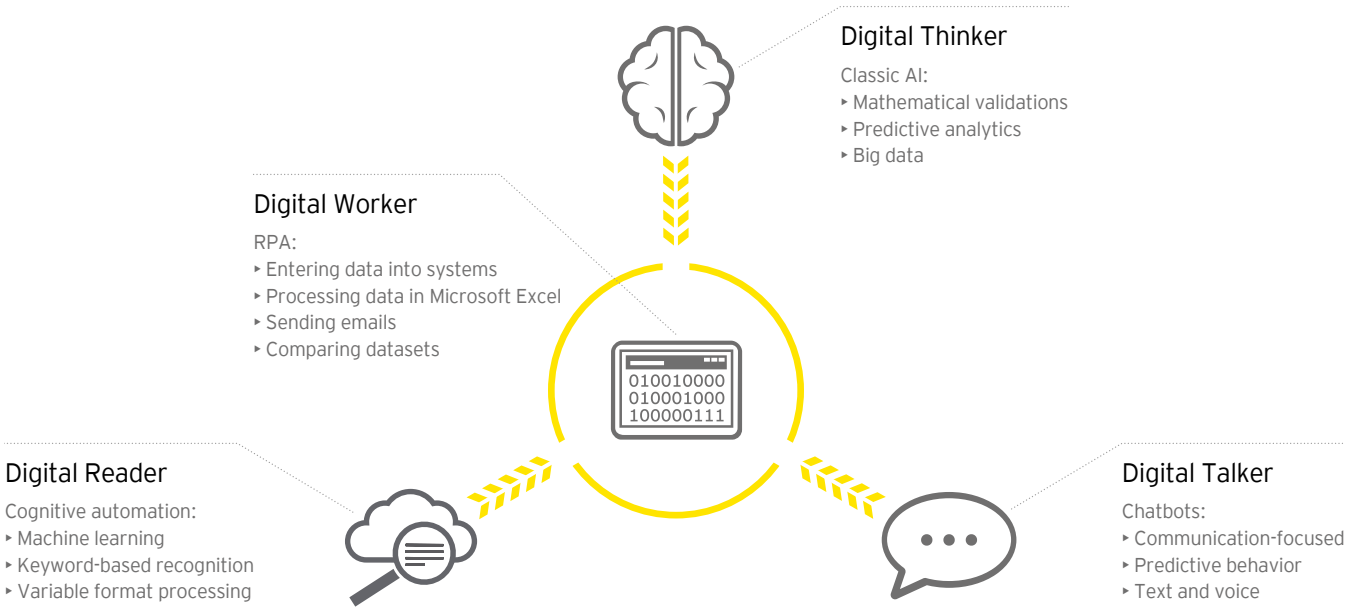
Digital Readers: cognitive automation tools, such as machine learning, keyword-based recognition and variable format processing

The Digital Reader will be responsible for capturing and uploading data for use across the enterprise. Today, for example, a warehouse employee must write down and manually enter new shipments of parts and equipment that arrive. The Digital Reader will capture images of packing slips and automatically update the inventory.

Digital Workers: RPA tools that enter and process data, compare datasets, send automatic emails, and more

Digital Workers integrate with Thinkers, Readers and Talkers to execute tasks. They are the "digital labor" that create work orders, update inventory, implement price changes and much more.

These digital employees will support and inform their human counterparts while handling repetitive, high-volume tasks quickly and efficiently. Human employees will build relationships, provide subjective judgment, deliver low-frequency tasks, and manage change and improvement. Working side by side, digital assistants will enable humans, the "who" in intelligent automation, to do far more than they are capable of today, and their organizations will benefit.



What are the components of intelligent automation?

A critical business strategy

Oil and gas companies considering digital implementation often think about it as a traditional, IT-driven approach: choose a vendor, buy specific tools, and cascade the rollout across the enterprise.

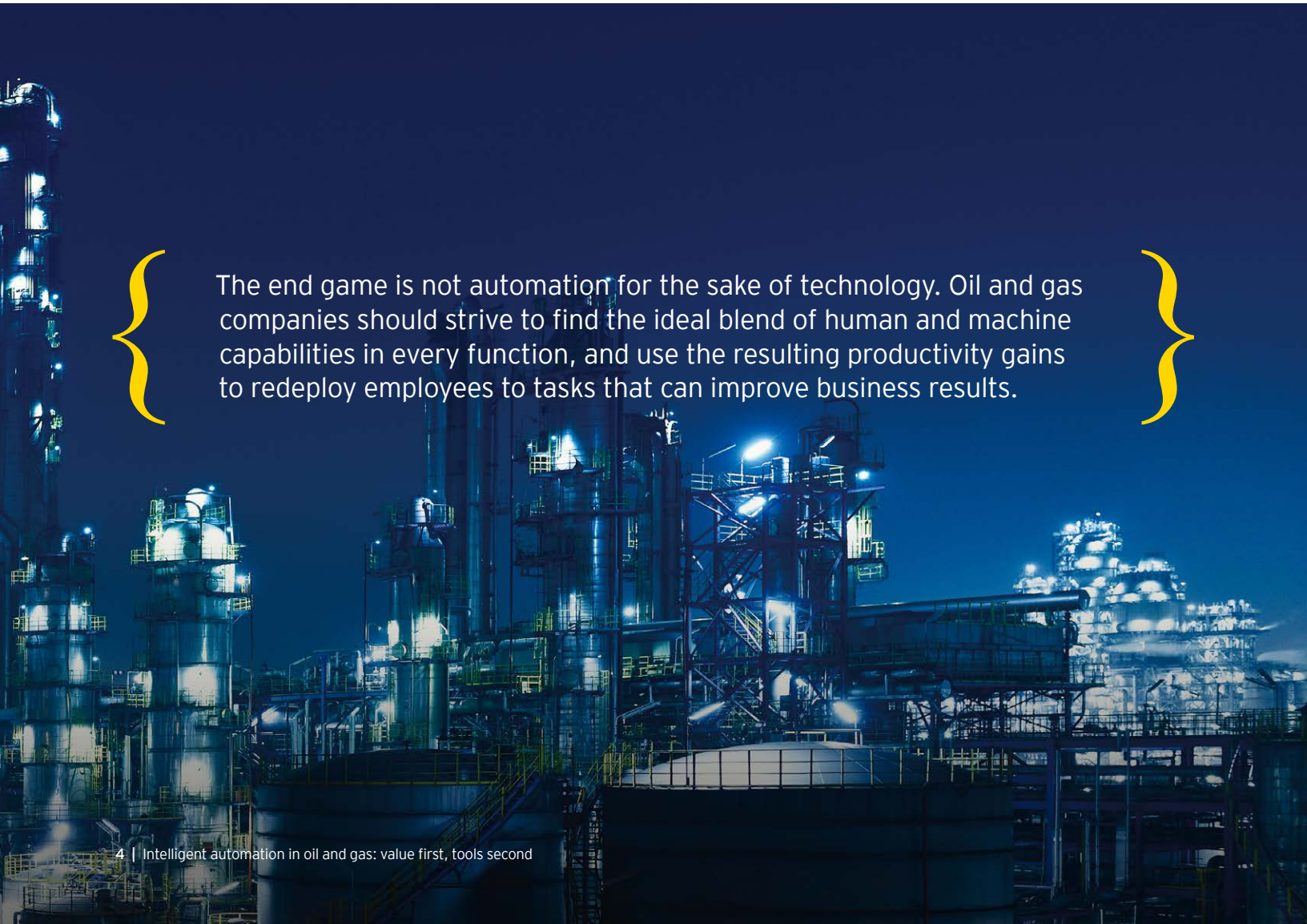
But intelligent automation is not a technology issue. It's a critical business strategy, and it requires leaders to consider the "big picture" where the company is headed, how it should be structured to drive business results and, most importantly, what skills, activities and processes are needed to achieve that vision.

Once those parameters have been identified, the digital strategy can benefit from thinking about the four capabilities (Digital Worker, Talker, Reader and Thinker), the value they can deliver, and how they should be integrated for maximum benefit.

For example, IoT makes it possible to capture significant amounts of data from devices. But that data has no value if your company lacks the digital thinking tools to evaluate it and make decisions. Rather than evaluating IoT tools first, consider the role of a Digital Thinker and the information that employees need to finalize decisions and implement them. Once that has been determined, the proper IoT solutions can be explored.

Another example: what obstacles currently exist that hamper better, faster service to your internal and external stakeholders? Consider how Digital Talker technology could speed response time and reduce errors. Where could your company deploy chatbots to improve communication between employees to benefit customer service?

The value proposition of intelligent automation is realized when Digital Thinkers, Talkers, Readers and Workers are fully integrated with human counterparts who possess the skills and mindset to work in a seamless manner with technology.



The end game is not automation for the sake of technology. Oil and gas companies should strive to find the ideal blend of human and machine capabilities in every function, and use the resulting productivity gains to redeploy employees to tasks that can improve business results.

The impact on the human workforce

Intelligent automation will automate a wide range of routine tasks in the oil and gas industry, both in the field and in support functions such as finance, accounting and human resources. In general, employees will move from data collection and reporting duties to more value-added activities.

Because of this shift, some industry jobs may no longer be necessary. At the same time, new jobs, requiring different skillsets, will be created. And while conventional wisdom suggests that a rise in robotics will lead to significant job loss, studies show that countries that are leading the way in robotics, such as Germany and Japan, have experienced the strongest levels of job growth over the past decade.[1] Today, Germany's unemployment rate is at its lowest level since 1990, and Japan's is lower than at any time since 1994.[2] Despite the growing influence of digital technology, the unemployment rate in the developed world stands at 5.5%, closing in on a 40-year low.[3]

The experience of countries such as Germany and Japan suggests that robotics and digital labor should be considered *enabling* technology because, when it takes over routine transactional tasks, it increases employee productivity and expands workers' area of focus.[4] And it creates new opportunities for employees with specific skillsets who can seamlessly integrate with digital tools to drive value for their organizations.

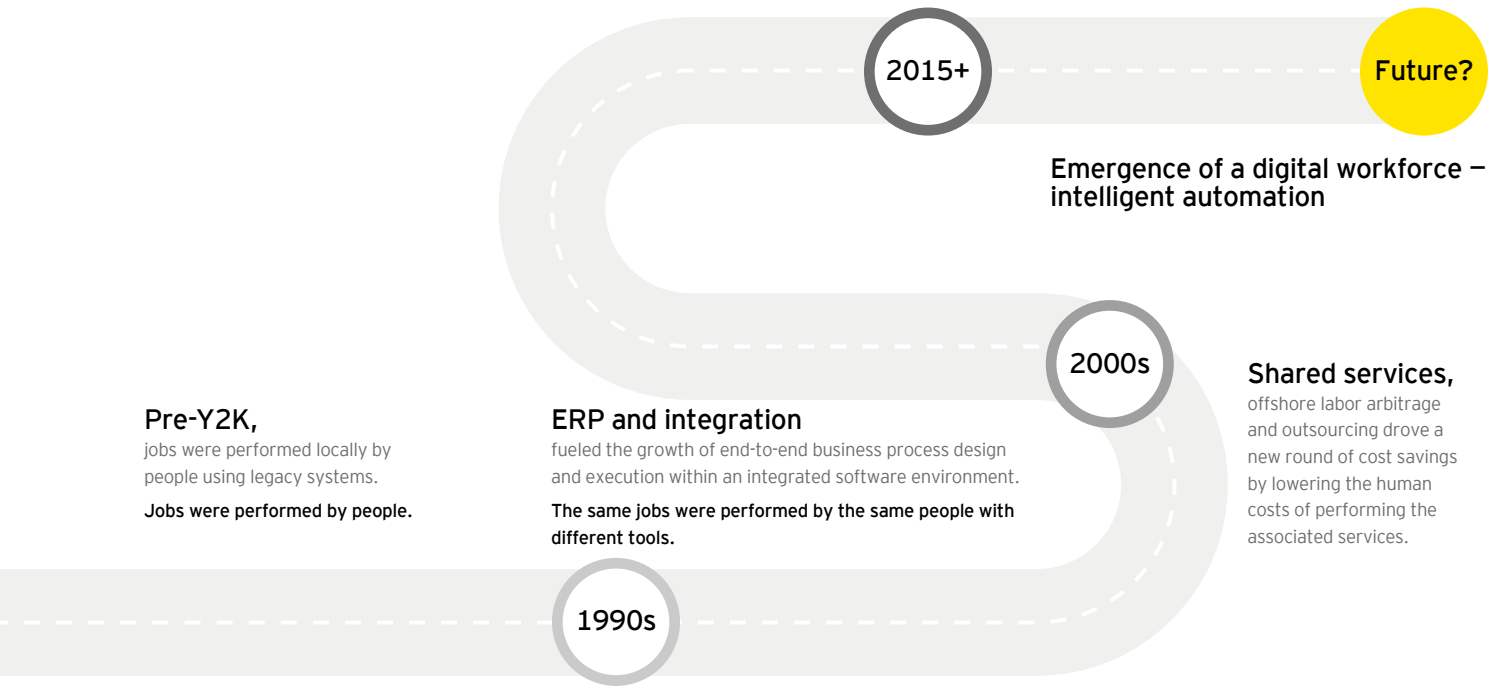
The end game is not automation for the sake of technology. Oil and gas companies should strive to find the ideal blend of human and machine capabilities in every function, and use the resulting productivity gains to redeploy employees to tasks that can lead to better business results. They should also leverage change management techniques and communications with existing employees to maximize the use and understanding of intelligent automation. This would help the human workforce to embrace, rather than resist, the change.

[1] "No, that robot will not steal your job," *New York Times* website, https://mobile.nytimes.com/2017/10/07/opinion/sunday/no-that-robot-will-not-steal-your-job.html?_r=0&referer=, accessed 3 November 2017.

[2] Ibid.

[3] Ibid.

[4] "Will technology enable workers or replace them? A long-read Q&A with Daron Acemoglu," *AEIdeas website*, https://www.aei.org/publication/will-technology-enable-workers-or-replace-them-a-long-read-qa-with-daron-acemoglu/, accessed 3 November 2017.



Finding the right human "who"

Oil and gas companies must begin attracting and developing employees with the specific skills and work styles that make intelligent automation possible.

Individuals with analytical skills and the ability to utilize data mining and other digital tools to synthesize information are increasingly valuable. Additionally, innovation, agile thinking and hyper-collaboration are all skills that aren't commonly recruited for today, but will be needed in the future. Today, oil and gas employees will most likely have more of a traditional information technology background. The industry is also pushing universities across the US to bolster their data analytics offerings, and degrees in the field are becoming more common. However, the most immediate source for these skills will likely be outside of traditional four-year university courses, from individuals who have developed digital skills on their own and are working in the tech industry.

Oil and gas companies will need to compete with the nation's leading technology firms, as well as other industries, for these sought-after employees. That means changing the culture of the industry to appeal to individuals who might otherwise have no interest in working in oil and gas.

To attract talent, companies need to look for opportunities to increase collaboration and teamwork and allow employees to demonstrate creativity and innovation. Employees today want flexibility and opportunity, and they seek out like-minded environments. For many of these employees, the chance to revolutionize an industry through digital is an exciting opportunity; one they could be on the forefront of in oil and gas.

There are other advantages the industry can tout. The opportunity to work in locations around the globe, and the amount of investment that companies are making in above-ground digital technology, fit perfectly with many potential employees' interests.

The energy industry has historically focused on assets rather than people. But in the digital age, talent can be a differentiator and a competitive advantage. That's a mindset that oil and gas companies will need to adopt, and quickly, to attract workers who can maximize the value that digital offers.

Identifying digital talent

To make intelligent automation successful, companies need employees who demonstrate:

- **Flexibility in ambiguous situations.** Data analytics is not like engineering, where there are hard and fast rules. The digital world requires employees who are comfortable "reading between the lines" and making recommendations.

- **The ability to adapt to a changing environment.** Artificial intelligence and machine learning create constantly changing dynamics and processes. Employees must be adept at change, too.

- **Creativity in using technology.** As the technology evolves, so will its uses, and the employees who succeed will discover new ways of using these tools to drive value.

How EY can help

The digital transformation is happening, perhaps even more quickly than many executives realize, because the technology is currently available and it works. Smart companies will create a comprehensive digital business strategy, take advantage of these tools and, at the same time, build a workforce that is eager to embrace the digital future and capable of utilizing technology to deliver better, faster results.

At EY, we don't start with a digital issue — we start with a business issue, and then build a plan fit for a digital world. Our deep understanding of new technologies and innovation, professional judgment and human insight helps us to build confidence in a digital world.

With our global presence, digital-enhanced methodologies and deep sector insights, EY helps oil and gas companies develop and execute a comprehensive and agile digital business strategy that leverages intelligent automation to seize opportunities and deliver value. We can help companies overcome the workforce challenges of navigating this transformation, including change management necessary with adopting the technology as well as attracting and retaining the workforce necessary to thrive in a digital world. We are focused on leveraging the power of digital technology to drive efficiency and returns across an organization, from strategy to execution.

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The oil and gas sector is constantly changing. Increasingly uncertain energy policies, geopolitical complexities, cost management and climate change all present significant challenges. EY's Global Oil & Gas Sector supports a global network of more than 10,000 oil and gas professionals with extensive experience in providing assurance, tax, transaction and advisory services across the upstream, midstream, downstream and oil field subsectors. The Sector team works to anticipate market trends, execute the mobility of our global resources and articulate points of view on relevant sector issues. With our deep sector focus, we can help your organization drive down costs and compete more effectively.

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