

Digitizing Energy

# Digital Disruption in Oil and Gas

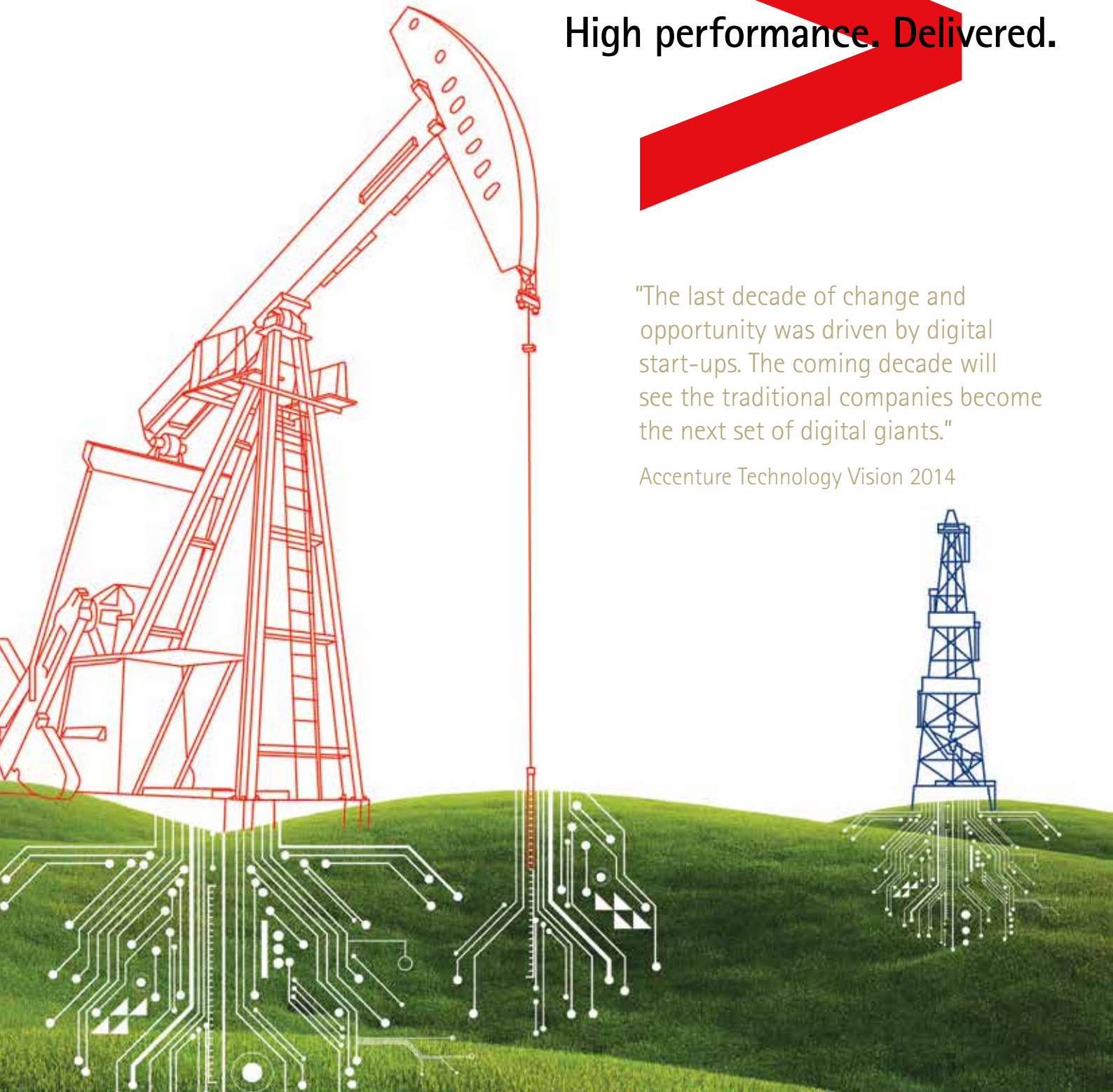
Industry Supplement to  
Accenture Technology Vision 2014

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**High performance. Delivered.**

"The last decade of change and opportunity was driven by digital start-ups. The coming decade will see the traditional companies become the next set of digital giants."

Accenture Technology Vision 2014



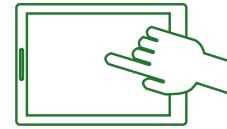
# From disrupted to disruptor

Back in 2005, text messages were sent peer to peer, and blogs were typically long essays. Founded the following year, Twitter bucked traditional blogging and allowed users to broadcast microblog posts (tweets) to the world.

The social networking service was seeing 500 million tweets per day, 215 million monthly active users and 100 million daily active users at the time of its stock market launch in October 2013.<sup>1</sup>



**500**  
million tweets



**215**  
million  
active users/month



**100**  
million  
active users/day

## So why is this relevant to the energy industry?

Over the past decade, technology companies such as Twitter, Google and Amazon found rapid, tremendous success, not only by understanding the technology of digital disruption such as analytics, mobility, cloud computing and social media, but also by making them part of their core business strategies and thus creating a significant competitive advantage.

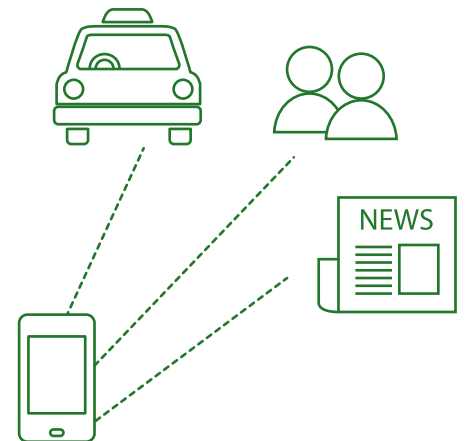
The energy industry—faced with increasingly difficult challenges such as declining production rates, a retiring workforce and cost control of remote megaprojects—has as much or more to gain as any other industry by harnessing digital disruption and technical innovation. The race is on for energy firms to understand how to leverage the concepts of digital disruption to help solve these pressing challenges and continue delivering shareholder value.

However, while the concept of digital should be straightforward, the execution is anything but easy. Accenture research shows that while many executives recognize the transformational potential of digital technologies—especially in an industry drowning in data and active in scattered, remote locations—energy leaders still have difficulty executing the ideas. A recent Accenture survey of global C-level executives found respondents in the energy sector slightly more likely than those in other industries to have aggressively pursued and invested in mobile technologies and, to consider mobility a key part of their business strategy. However, the progress energy respondents have made toward key mobile priorities generally lags that of their peers.<sup>2</sup>

The Accenture Technology Vision 2014,<sup>3</sup> which identifies the top trends Accenture sees shaping technology, provides lessons on improving execution and shows how the same trends that helped companies such as Google and Amazon to become digital disruptors are starting to make their way into the energy industry, creating new digital giants out of traditional industry players.

# The digital-physical blur

Today's digital giants achieved tremendous success in a relatively short period of time by transitioning digital technologies from the periphery of our lives to the core—transforming everyday activities such as how we hail taxis, read the news and make friends. This “digital-physical blur” offers energy companies a model for using digital technologies to not just augment or tweak existing processes, but to radically change them for the better.



We are starting to see noteworthy industry examples of this digital-physical blur. SAP is creating a singular platform as well as analytics services for enterprise and upstream operations data,<sup>4</sup> and GE is developing a real-time virtual pipeline monitoring system.<sup>5</sup> In addition, several developing technologies show promise for industry applicability in the digital-physical blur.

## Wearable computing

Wearable computing devices, particularly ruggedized glasses, can allow workers in remote locations to receive over-the-shoulder coaching from their peers around the world. By enabling real-time collaboration, remote personnel can grant permit-to-work approvals, provide one-on-one training, offer guidance during safety events, and assist in repairs—all of which can help to eliminate rework.

It is not just glasses, either. The consumerization of smart watches, fitness devices and other wearable technology will likely drive down the cost and bring capability up to a point where energy companies can finally achieve the vision of a fully networked and “smart” worker.

## Drones

Unmanned aerial vehicles (UAVs), or drones, are another example of the digital-physical blur. UAVs have numerous industry-specific use cases, including

surveying pipelines, inspecting flare stacks, checking offshore platforms, ensuring wildlife safety and monitoring flare emissions. Fitted with a range of video and sensor technology, these aerial robots can extend the reach of workers to locations that are either too remote or dangerous.

New research from the Accenture Technology Labs, *It's Time for Flying Robots: Key recommendations for making unmanned aerial vehicles operational*, shows UAVs present significant cost savings opportunities in “automated data gathering, automated maintenance, integrity and surveillance workflow, and data analysis to generate predictive insights on facilities,” in addition to improving operator safety.<sup>6</sup>

Within the next three years, BP plans to deploy UAVs to inspect pipelines in remote areas of Alaska at a fraction of the cost of a piloted helicopter.<sup>7</sup> The drones will enable an engineer on the ground to make mission-critical decisions, using only a tablet computer displaying real-time pictures from onboard heat-seeking cameras along with relevant pipeline data. This innovative use of mobility demonstrates how digital technologies are enabling energy companies to gather, manage and leverage complex information to overcome the industry's biggest challenges.

## 3D Printing

As with drones, the maturation of 3D printing suggests increasing relevance for the industry. 3D printers are moving down the cost curve and are increasingly able to develop more complex products, making them a more competitive alternative to shipping and storing assets. This new digital supply chain could enable the manufacturing of parts that are no longer in production, the development of highly specialized tools, and the production of parts where and when they are needed offshore or in remote locations such as the Arctic.

3D printing is likely to become a hotly contested area for oilfield services. Companies such as GE are already planning to begin 3D printing fuel nozzles for gas turbines later this year.<sup>8</sup>

# From workforce to crowdsource

One of the keys to the success of the digital giants is their ability to leverage large numbers of people outside of the organization to complete tasks. Whether in developing open-source software or creating applications on top of enterprise platforms, this additional leveraging has led to a market capitalization per employee significantly higher than many companies in the energy industry.<sup>9</sup> However, while a direct comparison of the number of employees in the oil and gas industry versus the digital industry is perhaps unfair, it is clear that there is room for the oil and gas industry to be more successful in leveraging its workforce to deliver growth and value to investors.



Using the cloud, social and collaboration technologies pioneered by tech firms provides the same opportunity for energy companies to improve the utilization of their massive workforce and deliver greater shareholder value per employee. It also provides inroads to optimize staffing and supplement their knowledge base to tackle new challenges via crowdsourcing.

One example of how workforces are being extended outside the traditional enterprise is through Kaggle, a crowdsourced analytics and predictive modeling problem-solving platform, which has produced successes in industries ranging from industrial

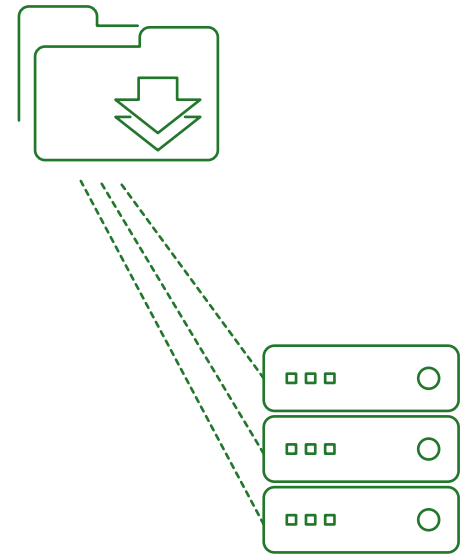
manufacturing to pharmaceuticals.<sup>10</sup> The competition-oriented platform has been used by organizations from incubating ventures to NASA and GE.<sup>11</sup> At the heart of Kaggle's model is the ability to tap into a wide range of experts and data scientists from around the world to create a range of models that are better and more diverse than what can traditionally be developed in house. Within the energy industry, Kaggle could provide a platform to evaluate where to lease, how much to bid or how to improve recovery.



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# The data supply chain

Few are aware of Google's data warehouses, which processed more than five billion Web searches per day in 2013. For a digital company, data is the lifeblood of the organization and it flows seamlessly throughout the company.<sup>12</sup> This concept, which Accenture's Technology Vision 2014 calls the data supply chain, represents a different way of thinking about how data is sourced, modified and delivered to the business to create value.



The energy industry has invested heavily in data over the past decade. However, despite this significant investment, data continues to be of poor quality, siloed and growing exponentially without delivering on promised benefits. Many companies may be forgiven for thinking that a significant return on their data is out of reach.

However, visionary leadership and determination pay off. For example, producers looking at enhanced oil recovery techniques are using data from the well to connect to a central analytics capability in real time, meaning they can see the immediate effect of increased pressure and react accordingly. By focusing on areas such as pressure, pumping or the management of surfactants, companies can better understand producer failures and achieve additional production and cost savings.

These types of successes have led to increased investment activity in startups like Mobilize (backed by Chevron Technology Ventures) and activities such as GE and Accenture teaming on predictive analytics to develop innovative software for aggregation, visualization and predictive management of field data for oil and gas. These concepts are not just for small, new software-as-a-service (SaaS) ventures. SAP has invested heavily in cloud offerings and SAP HANA—its real-time big data technology—including co-innovating oil and gas solutions with Accenture.<sup>13</sup>

# From periphery to the core

The global energy sector is being reshaped by a confluence of diverse forces. As a result, existing operational approaches and legacy business models are being tested like never before. Against this backdrop, digital technologies provide organizations with an opportunity to achieve significant improvements in performance. Forward-thinking players that successfully transform into digital businesses by embracing new ways of working will become the industry's disrupters of tomorrow.

The time has come for energy leaders to define their organization's place in this brave new digital world. Each one has an opportunity to be a digital disrupter—recreating and redefining their businesses to create competitive advantage. The potential for growth is limited only by the creativity of the enterprise itself.





## Resources

<sup>1</sup> "Twitter passes 241m monthly active users, 184m mobile users, and sees 75% of advertising revenue from mobile", February 5, 2014, *The Next Web "TNW" Magazine*, via Factiva.

<sup>2</sup> *Mobility: Fueling the Digital Surge*, Accenture Mobility Insights Report 2014; [www.accenture.com](http://www.accenture.com).

<sup>3</sup> <http://www.accenture.com/microsites/it-technology-trends-2014/Pages/home.aspx>

<sup>4</sup> Accenture and SAP Expand Industry Focused Joint Solutions to Help Oil and Gas Companies Improve Upstream Operations, Accenture press release, January 14, 2014, [www.accenture.com](http://www.accenture.com).

<sup>5</sup> "The installed base of wireless M2M devices in the oil and gas industry reached 423,000 in 2013," April 13, 2014, *Middle East North Africa Financial Network (MENAFN)*, Copyright 2014. Middle East North Africa Financial Network Inc., via Factiva.

<sup>6</sup> *It's Time for Flying Robots: Key Recommendations for Making Unmanned Aerial Vehicles Operational*, Accenture, 2014, [www.accenture.com](http://www.accenture.com).

<sup>7</sup> "BP go-ahead for drones over oilfield", 11 June 2014, *The Times*, © 2014 Times Newspapers Ltd. All rights reserved, via Factiva.

<sup>8</sup> "The Jedi Nozzle: GE Looks to Revolutionize the Oil & Gas Industry with 3D Printing", January 28, 2014, GE Reports, via Factiva.

<sup>9</sup> Accenture Research, based on company financial data.

<sup>10</sup> <https://www.kaggle.com/>

<sup>11</sup> "High flyer aims for aviation overhaul," June 16, 2013, *The Australian*, © 2013 News Limited, via Factiva.

<sup>12</sup> "Google handled an average of 5.134 billion Web searches per day last year," November 18, 2013, *Inland Valley Daily Bulletin*, © 2013, Inland Valley Daily Bulletin, distributed by NewsBank Inc, via Factiva.

<sup>13</sup> Accenture and SAP Expand Industry Focused Joint Solutions to Help Oil and Gas Companies Improve Upstream Operations, Accenture press release, January 14, 2014, [www.accenture.com](http://www.accenture.com).

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