

BRAWNS, BRAINS AND THE BALANCE SHEET



**Shale 2.0 heralds
profitable and
predictable growth**

DIGITAL EFFORTS MUST DRIVE ECONOMIC VALUE

Technology and intrepid entrepreneurs unlocked unconventional plays in North America and upended our industry over the past decade. But don't be fooled into thinking that a new normal, however uncomfortable, has arrived. These forces for disruption are still at work.

Operators, service companies, and technology providers young and old are working weekends to add intelligence to the machinery, materials, and processes — the “brawn” — that powered the shale revolution. The challenge now, in North America especially, is not to produce the most oil and gas the fastest but to produce the right amount, from the right wells, at the lowest cost per barrel of oil equivalent (BOE).

Embedded sensors, field to cloud computing, and big data analytics are finally cost-effective, and, more importantly, are being deployed by exploration and production (E&P) experts with an eye on near-term results. Halliburton, for example, is delivering the Voice of the Oilfield™¹ in plays like the Bakken, where operators must reduce equipment downtime and health, safety, and environmental risks without deploying personnel to producing fields more frequently. Halliburton has also pioneered the E&P Digital Twin in well construction², understanding that well construction faces challenges beyond those typically found in manufacturing. To be accurate, the E&P Digital Twin for well construction should not only be a virtual representation of machinery — well, rig, and downhole equipment — but also of fluid and subsurface properties that require extensive domain knowledge to model, due to their inherent uncertainties. Accenture, for example, recently opened an Innovation Center and Liquid Studio in Houston, for oil and gas companies needing to accelerate software application development.

There is little question that adding such “brains” to “brawn” will drive down costs and open new avenues for growth in this next chapter for shale.

But what about profitable and predictable growth? Shareholders are asking operators to help ensure that digital efforts would drive more than efficiencies — that they would, without a doubt, increase shareholder value.

CREATING VALUE WITH A MANUFACTURING MINDSET

The US upstream sector has long focused on total shareholder returns (TSR) and/or production growth at the expense of corporate returns. Even as the predictability of shale plays has improved, operators have outspent cash flow and stretched their balance sheets to improve TSR and production. Meantime, average returns on equity for E&P operators have been falling consistently — even during times of high oil prices (Figure 1). As importantly, the oil and gas industry misses quarterly earnings expectations more than any other industry (Figure 2). As a result, long-term investors have walked away from the sector as oil price expectations have fallen and oil and gas companies have been unable to reliably earn returns.

Figure 1: Average return on equity for upstream operators (2005 to 2016)

Source: Bloomberg, Accenture analysis

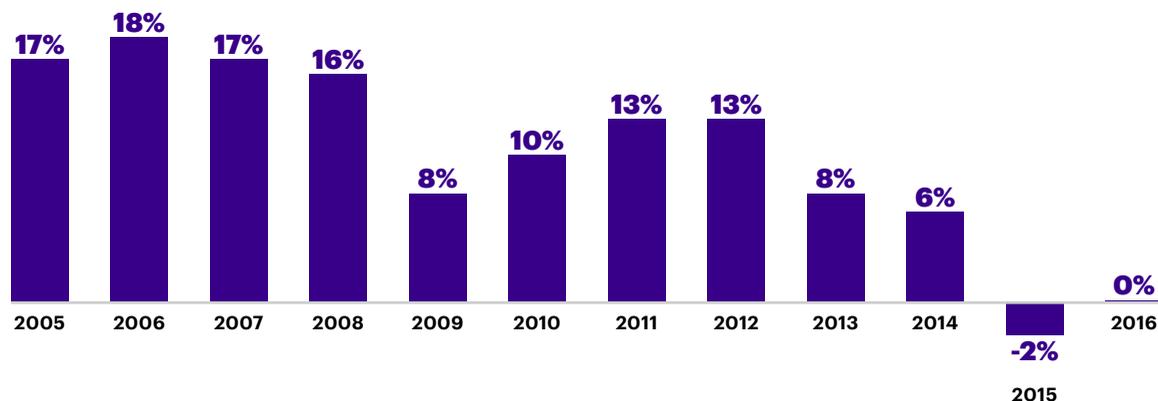
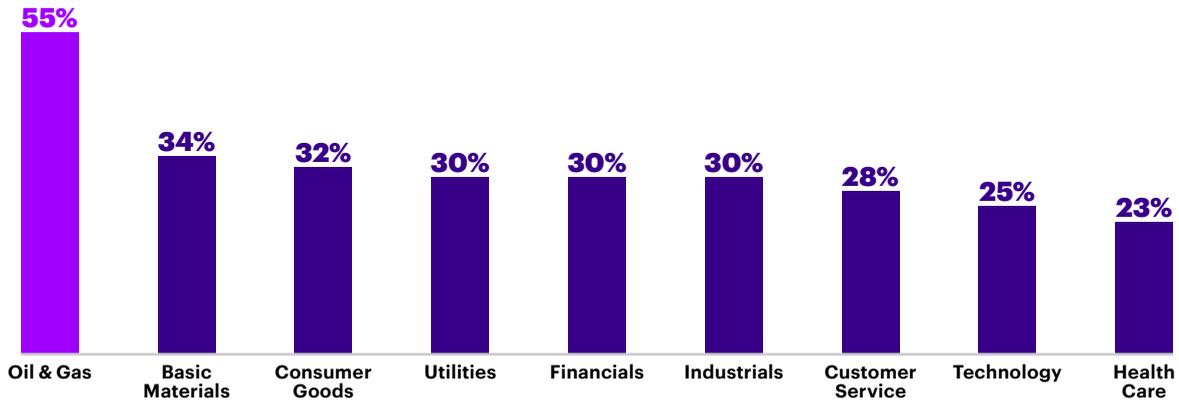


Figure 2: Percentage of years in which earnings were missed for several industries (2012 to 2016)

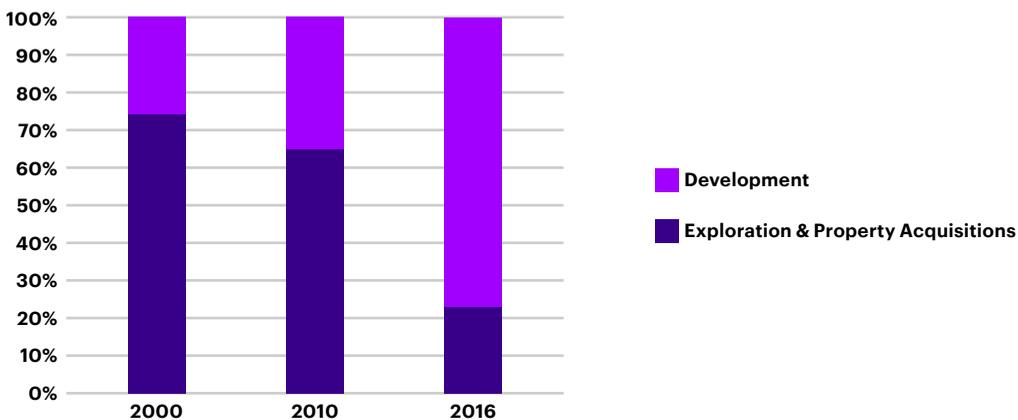
Source: Bloomberg, Accenture analysis



To help address this challenge, Halliburton and Accenture have come together with Palantir Solutions to look at how lessons learned from other industries can be applied in oil and gas. First, we focused on how the way operators invest has changed. In 2000, more than 75 percent of upstream expenditures went to exploration — whether through the drill bit or via M&A (Figure 3). Today the story is much different. More than 75 percent of spending is on development. E&P companies have become “manufacturing companies” without realizing it. This shift challenged us to think about how the manufacturing industry itself has addressed becoming more predictable and efficient in investing capital.

Figure 3: US exploration and production expenditures (2000 to 2016)

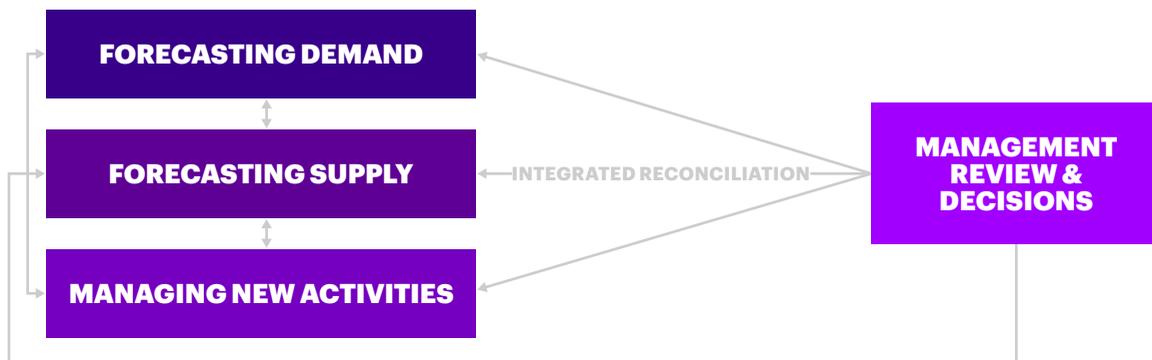
Source: Rystad Energy, Accenture analysis



Manufacturing companies struggled for decades to generate more value by better adapting internal operations to changing external forces like demand and commodity prices. As a result, they adopted Sales and Operations Planning (S&OP)³. S&OP was introduced in the 1980s as a process for bringing sales, operations, and finance together at regular, frequent intervals, with quality data, to make needed course corrections based on the current environment (Figure 4). The goal was to achieve agreement from finance and operations on the most profitable path forward given realities that had likely changed since plans were last put in place.

Figure 4: How S&OP works in manufacturing

Source: Accenture



MANUFACTURING BENEFITS:

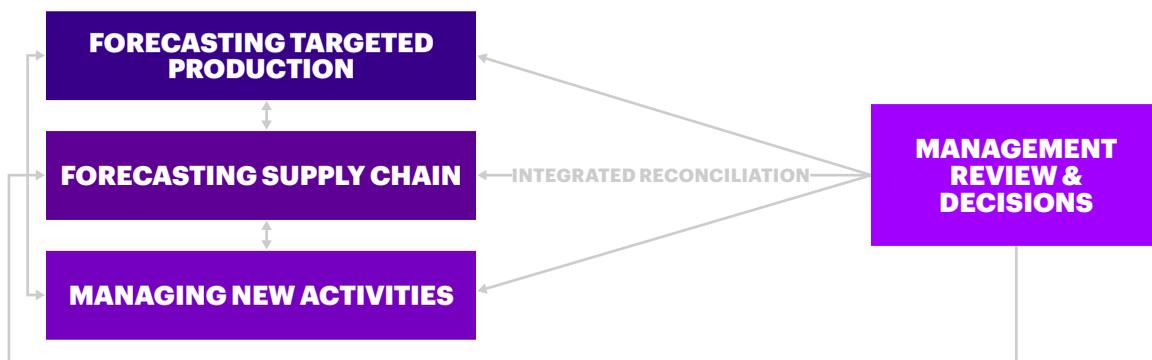
- Forecast accuracy
- End-to-end visibility
- Topline growth
- Asset utilization
- Reduced cost
- Reduced working capital

The desired outcome of current digital efforts is Digital E&P. In Digital E&P, field and board room are aligned and value is consistently improved through greater asset intimacy. S&OP can be applied to oil and gas to improve asset intimacy and the capital planning and allocation decisions it drives (Figure 5).

Instead of forecasting demand, E&P companies working in shale forecast targeted production for the coming 12-18 months based on expected cash flow, reservoir constraints, and market conditions. Instead of forecasting supply they forecast the supply chain needed for service company requirements, capital funding, and personnel. There are constantly new activities to manage such as portfolio acquisitions or divestitures, partnerships, changes in services availability or cost, and price fluctuations. Management and front-line workers need an integrated view of these activities and forecasts to reconcile their expectations and actions and to maintain a single current and accurate version of the truth, so they can reconcile frequently and confidently.

Figure 5: Translating S&OP for oil and gas

Source: Accenture



REQUIRES:

- Single version of the truth
- Real-time information on “sales” and “demand”
- Level of comfort with forecasts
- Bridge petro-technical and ERP

It is through this integrated reconciliation, using quality current data, that capital can be reallocated in time to make a difference on earnings, and analysts’ expectations can be managed.

THE RIGHT DIGITAL PROJECTS FOR SHALE 2.0

Digital technology is introducing radical transparency to the E&P industry by generating and integrating many streams of information. The challenge is to use this information to increase focus, not noise. Operators want digital projects to help them focus on achieving the right production volumes, from the right wells, at the lowest cost per BOE in order to predictably generate good returns.

Learning from S&OP, this achievement requires:

- Technology that integrates financial and supply chain information with operational and petrotechnical information for trusted results. Note that this integration will not be achieved without the CFO and COO's offices. These offices will become strategic partners in the business as companies want every dollar of capital to drive earnings.
- Business processes that demand frequent reconciliation between field and board room.

Creating and deploying Digital E&P solutions for more effective capital allocation requires co-innovation. This is the approach that Halliburton, Accenture, and Palantir Solutions are taking together and with customers to help deliver such solutions. The combination of Halliburton's open industry platform combined with Accenture's experience in Enterprise Resource Planning and systems integration, and Palantir Solutions' integrated E&P planning software puts us in a unique position to help operators unlock economic value during Shale 2.0.

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To learn about Accenture's collaboration with Landmark Halliburton, visit www.accenture.com/landmark

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- ² Olivier Germain, Dale McMullin, Gabriel Tirado. "Using the Digital Twin in Well Construction". Houston : Halliburton, 2017.
- ³ Massachusetts Institute of Technology, Supply Chain Design *MITx MicroMasters® Credential in Supply Chain Management*.

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