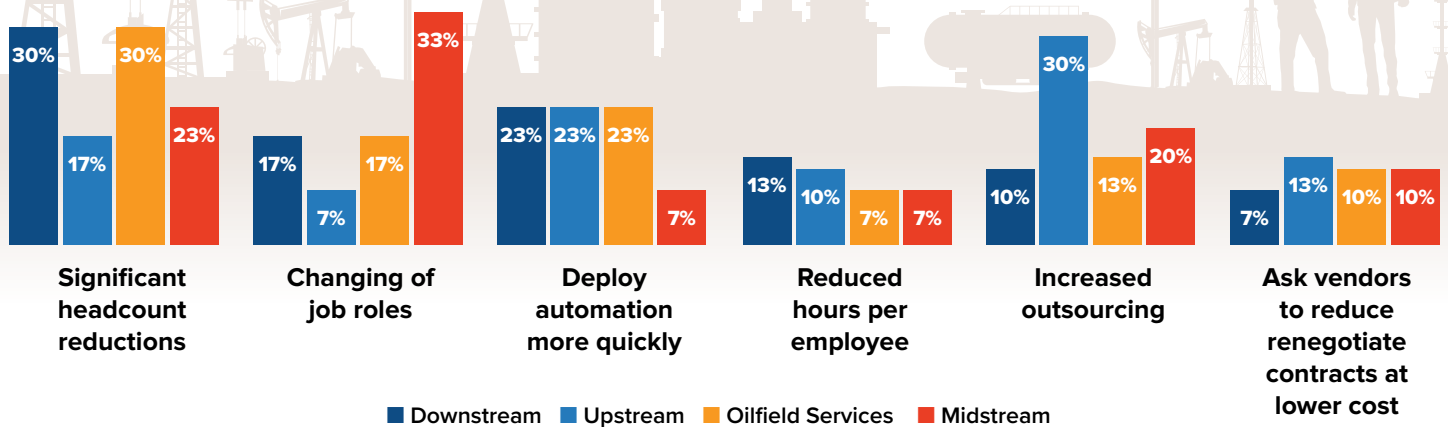# Building Resilient Oil and Gas Operations

The commodity price collapse and increased safety initiatives are forcing the oil and gas industry to shift from a safety-challenged, labor-intensive business model to a more resilient operational structure by using automation and AI. IDC surveyed industry leaders from upstream, midstream, downstream, and oilfield services on the impact to their businesses of the industry downturn.

Impact of Downturn to Oil and Gas Segments

	Downstream	Upstream	Oilfield Services	Midstream
Significant headcount reductions	30%	17%	30%	23%
Changing of job roles	17%	7%	17%	33%
Deploy automation more quickly	23%	23%	23%	7%
Reduced hours per employee	13%	10%	7%	7%
Increased outsourcing	10%	30%	13%	20%
Ask vendors to reduce renegotiate contracts at lower cost	7%	13%	10%	10%

■ Downstream ■ Upstream ■ Oilfield Services ■ Midstream

*Source: IDC Oil & Gas Flash Survey, May 2020*

Oil and gas companies have always aspired to become more resilient enterprises, but a few have pushed it as a core strategic initiative

Volatile commodity prices and three significant downturns in the last dozen years have slowed that transition and put pressure on sustainable operating models. Disparate data silos and the inability to scale pilot projects across the organization have also hindered the development of a more resilient oil and gas enterprise. For example, it is common for an international oil company to pilot the use of predictive analytics and automation on one refinery but uncommon for it to scale the technology to the enterprise level and broader downstream portfolio.

Business leaders can address data silos by using automation and AI to build resiliency, reduce costs, and improve employee wellness. Adding operational visibility enhances safety by moving personnel offsite and predicting incidents.

Utilizing automation and AI

In resilient decision making, data is leveraged to develop real-time insights and automation. In oil and gas, the data to support these insights and potential automation of functions is often located in operational siloes such as an engineer's reservoir model or a spreadsheet on a plant manager's personal computer. When data is siloed, inefficiencies and redundancies can build, a problem exacerbated by headcount reductions.
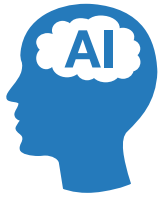
Companies using automation supported by AI are better able to make decisions regarding resource allocation for operations and maintenance.

Struggles finding data, sharing records, and applying asset information are common when companies reduce staff. The financial costs associated with inefficiencies, safety liabilities, and repurposing workforces for unpredictable industry cycles are extremely challenging.

The most noted industry response to the current downturn – aside from layoffs – was to deploy automation more quickly, an indication that business leaders recognize the related costs, safety, and operational benefits. Companies using automation supported by AI are better able to make decisions regarding resource allocation for operations and maintenance. AI makes it possible to predict equipment failure, enabling maintenance that increases asset life and uptime. Equipment failures also have environmental consequences that can challenge increasing ESG standards. Automation eliminates manual processes associated with asset utilization changes like shutdowns and restarts. Safety liabilities are reduced as fewer essential personnel are needed on site. Increases in both worker safety and asset uptime are linked to profitability, and they will be increasingly critical to future operations.

The following elements are key to creating a resilient decision-making organization in oil and gas:

- Connected assets: Pumps, compressors, pipelines, and other equipment must be linked and digitized to provide the necessary data for autonomous operations and resilient decision making.

- Data: Organizations must harvest existing data as well as foster clean and consistent asset data to improve future functionality.

- Analytics: Once an asset is connected, it is important to obtain its data in a consumable form for automation and AI.

Industry Benefits of Resilience

Return on investment is of the utmost importance in oil and gas because of the lack of distinctive quality in producing a global commodity. Applying AI and automation can improve business resiliency by reducing downtime, decreasing safety liability, and increasing an asset's life cycle. Long-term effects of a resilient organization are operational and financial performance increases, enhanced safety standards, and a more sustainable business model.

Message from the Sponsor

Insights from connected assets are critical to understanding the preventive, predictive, and prescriptive actions needed to maintain equipment, optimize performance, and avoid downtime. IBM possesses the essential combination of software, services, and industry expertise to help you implement secure, AI-powered, connected manufacturing operations across the value chain and employ the power of edge computing to respond rapidly to changing conditions. Wherever you are in your digital journey, IBM will partner with you to deliver the AI-powered insights and consultative services you require to ensure efficient and reliable manufacturing operations.

Learn more at ibm.com/business-operations