Extracting Greater Value from Data

New insights for the oil and gas industry from IBM and SAP
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A digital turning point
How digitalization is signaling a new era for oil and gas companies

In a volatile and rapidly changing industry, the exponential growth in data in combination with intelligent solutions and services is creating unprecedented opportunities to capture new value.

The digital opportunities
Digital technologies are transforming the world around us. Artificial intelligence (AI) capabilities like cognitive computing, machine learning, natural language processing, and robotics are already proven across such diverse industries as cancer research, customer service, and education. For today’s global oil and gas industry, digitalization offers huge opportunities to improve the way it does business, increase cash flow, and improve employee productivity.

The industry has employed digital technologies since the 1980s. Yet many digital initiatives of the last decade have been seen as evolutionary rather than transformative, achieving incremental performance improvements but with little impact on existing operating or business models. As a World Economic Forum white paper noted, “…the industry could benefit more by pursuing a revolutionary agenda with digital as a backbone. Digital transformation has the potential to create tremendous value for both the industry and society as a whole.”

The same report identifies four key digital transformation opportunities:
• Digital asset lifecycle management to transform operations
• Circular collaborative ecosystem to fast-track innovation, reduce costs and increase operational transparency
• Beyond the barrel: innovative customer engagement models to open new revenue opportunities
• Energizing new energies to promote new sources and innovative models for optimizing and marketing energy

A digital backbone
This transformation will be enabled by a digital backbone that provides a flexible and scalable platform to bring together intelligent technologies, including:

- Cloud computing
- Big data and analytics
- The Internet of Things
- Mobile devices
- Machine learning
- Blockchain

To succeed at this digital turning point, oil and gas companies need a coherent digital vision with clearly articulated strategies and a focus on business outcomes.
The industry is on the cusp of a new era, shaped by a new wave of business and digital technologies and propelled by a series of macroeconomic, industry, and technology trends.

Supply and demand dynamics
Supply disruption continues to be a challenge. After several years of oversupply, the industry could be heading for a supply crunch as global oil demand strengthens. Production in existing fields is declining, exploration spending is only rising slowly, and new discoveries are at their lowest level since the 1950s.

Maturing assets and declining resources
Supply is also being disrupted by deferred maintenance and shortages of skilled labor. Maintenance remains essential in basins with aging asset infrastructures, yet some operators have put off noncritical spending in recent years to reduce costs. Similarly, workforce reductions to save money have resulted in lost technical skills and damaged the industry’s ability to attract new talent.

Energy geopolitics
In some countries, production is down due to local economic, political, or social difficulties. If supply was to stop completely, it is unclear how lost capacity would be replaced.

Rapid advances in technology
The growing sophistication of platforms and technologies, coupled with the ability to process and analyze data rapidly, enhance business agility and support real-time decision making and execution.

Changing consumer needs and expectations
In every industry, consumers expect ever-increasing levels of engagement, personalization, and speed. Growing environmental awareness is also influencing their energy choices as they seek greater transparency from suppliers.

Moving towards a lower carbon world
The industry is also having to deal with the gathering momentum to build a lower carbon world. Growing electrification of transport and the possible plateau in oil demand by the 2030s will force companies to develop new business models to mitigate risks and maintain a profitable portfolio amid this transition.

Faced with these uncertainties, oil and gas companies must develop a resilient strategy for the future across their entire operations from well to customer, driven by digital transformation.
Gone are the days when a barrel would be extracted at any cost. Today’s focus is on profitable production: prioritizing and deploying your capital and resources to optimize the economic returns from the field.

As the conduit between reservoir and surface, the well is the start of the journey along the value chain and sets the standard for the rest of the value chain. The location of most wells was decided many years ago, and the cost of moving a well or drilling a new one is usually prohibitive. However, the industry has proved adept at driving down costs and reducing drilling days in unconventional fields. Digital technology has sharpened the focus on increasing recovery and decreasing uncertainty.

With this digitalization comes greater visibility of all aspects of the well. Emerging capabilities like machine learning, Internet of Things (IoT), and cognitive analytics bring deeper insights and better situational awareness, yielding more accurate and unbiased predictions, impact assessments, recommendations, and hypotheses. SAP provides a unified data model that brings these newer digital technologies and data sources together with production, maintenance, and cost data in a single model based on functional location to represent the well (or well completion).

Armed with these insights, executives can rank and prioritize wells based on business outcomes – whether volumes, revenues, or costs – and make informed strategic and tactical decisions at an individual well level.

SAP solutions deliver greater visibility around three key areas:

**Production optimization**
Based on integrated data from production, operations, maintenance, and finance, oil and gas companies can accurately monitor and control well production. They can also rank and prioritize their production, operations, and maintenance activities based on well profitability, deferred production and HSE compliance.

**Operational cost rationalization**
Oil and gas is one of the most asset-intensive industries in the world. Gaining real-time insights into asset performance from the analysis of sensor data integrated with business data increases the reliability, availability, performance, and safety of these critical assets by enabling the development of predictive maintenance schedules.

**Working capital alignment**
Efficient production and maintenance relies on having the right equipment, parts, and resources in the right quantities, in the right place, at the right time. Proactive inventory and service asset management — including demand data, inventory transparency, scheduling, and transportation — can streamline service delivery to new levels of efficiency.
Together, these capabilities can deliver:

- Better prioritization of oilfield activities
- Improved production forecasting
- More accurate costs at the wellhead
- Reduced equipment and material inventory and spend
- Greater understanding of individual well profitability and costs

Learn more

Manage the convergence of hydrocarbon production, maintenance, engineering, and financials. Explore how SAP can help.

Read more

Discover how cost-effective cloud, analytics and machine learning technology make it possible to do more with the Internet of Things.

Read the IDC whitepaper
Successful hydrocarbon trading is all about maximizing profit and minimizing risk. Explore why a consolidated, real-time view of both physical and paper commodity positions is essential.

In a volatile hydrocarbons market, the ability to react quickly to changes is vital. In an ideal world, that would mean having all the details about a deal available in one place, and updated in real time.

SAP S/4HANA delivers the procurement, sales, physical logistics execution, and risk management capabilities that oil and gas companies need in a single platform. It integrates seamlessly with other downstream processes to accelerate and simplify the complex process of trading commodities. By directly transferring procurement and sales data to financial and treasury systems, the software effectively prices and manages during the buying and selling process, eliminating spreadsheets and improving transparency and compliance.

The software enables you to:
- Generate contracts with prices based on market-based price quotes
- Automate provisional, differential, and final invoices, and run invoice simulations
- Decrease revenue leakage due to invoice miscalculations
- Save time and improve accuracy by automating price calculations
- Eliminate “out of system” calculations and post concise invoice receipts for purchases
- Adapt planning and execution of physical hydrocarbon movement as well as realize movements as completed, to continuously update inventories and positions

At the same time, you can accurately identify, measure, and manage commodity price risk exposures through a real-time view of all consolidated physical and financial commodity positions. As well as streamlining treasury processes, the software ensures compliance with the latest accounting and other regulations by providing one version of the truth with complete audit support.

This unique set of capabilities provides:
- A single, comprehensive view of your commodity business
- Enhanced legal and regulatory compliance built-in
- Decisions that are fully integrated with the physical supply chain, financial risk management, and accounting systems

Learn more

Optimize commodity pricing and better manage risk with SAP Commodity Management.

Go to the website >
Effective logistics can make or break a deal. Discover how digitally enabled and connected processes can optimize logistics and execution across the end-to-end hydrocarbon supply chain.

Once a bulk trade is completed, it’s essential to move the crude oil or natural gas to its destination as quickly and efficiently as possible across any mode of transport – whether rail, truck, ship, or pipeline.

SAP solutions enable the effective management and movement of bulk quantities by providing schedulers with real-time, post-trade visibility at every step of the hydrocarbon supply chain. Integrating real-time trading and scheduling activities helps streamline the processing and tracking of all inventories – both acquired and in movement – from post-planning and scheduling to post-custody transfer.

Together, these capabilities enable you to:

• **Orchestrate supply chain activities**
• **Optimize inventory**
• **Reduce storage and transportation costs**
• **Improve exposure management**

**Learn more**

Optimize logistics and execution of each step across the end-to-end hydrocarbon supply chain with SAP.

Read more ▸

Share SAP’s vision for connected hydrocarbon logistics.

Watch the video ▸
Maximizing uptime and minimizing downtime is key for every refinery. Explore how digital technologies can help improve process safety and operational integrity while reducing enterprise operating risk.

The combination of demographic challenges, advanced skills and certification requirements, and global workforce shortages is placing growing pressure on process safety and integrity in oil and gas operations.

SAP solutions can help optimize plant operations and asset performance by providing real-time visibility into the hydrocarbon processing environment. Integrating unit process data with ERP systems eliminates costly manual processes by synchronizing manufacturing execution with planning, scheduling, maintenance, and quality management – enabling you to manage production demands while maintaining asset safety and quality.

In addition, collaborative networks can drive fuller situational awareness, and recruiting platforms and managed service providers will help find the people with the right skills to meet business needs and compliance requirements.

Together, these capabilities enable you to:

- Enhance process and asset safety
- Employ a proactive, predictive maintenance approach
- Reduce operational risk

Learn more

Improve refinery operations with real-time analytics. Explore SAP Manufacturing Integration and Intelligence software.

Read more
The speed and efficiency of the journey from terminal to retail outlet is vital. Discover how automation can help streamline this logistics stage to fulfill contractual requirements and meet retail demand.

Whether customers are wholesalers or retailers, they expect an accurate and reliable delivery service. The “rack to retail” stage of the value chain journey is full of opportunities to save time and money through greater efficiencies.

SAP solutions automate sales and logistics processes for refined products and gases from order management to dispatching, data collation, and invoicing. They can forecast the replenishment of tanks, use best-buy scenarios, and perform route planning and truck dispatching for the delivery. The solutions cover processes at terminals, tank farms, wholesale and end customers, as well as service stations.

Together, these capabilities enable you to:
• Improve delivery speed and accuracy
• Enhance truck fleet usage
• Reduce inventory levels
• Increase customer satisfaction and loyalty

Learn more

Get more value from the Industrial Internet of Things (IIoT) by connecting manufacturing operations to your extended supply chain.

Read more
In the age of digitally connected and socially networked consumers, delivering an engaging experience across every touchpoint is essential. Explore how digital tools can help attract and retain profitable customers.

Potentially valuable information about individual customers and their buying preferences can come from a range of sources: point-of-sale data, order history, loyalty programs, and social media listening. The key is being able to translate raw data into meaningful insights.

SAP sales and marketing solutions enable you to build a single view of each customer – whether a wholesaler, retailer, or end consumer – and implement loyalty programs, optimize sales and channel strategies, manage distributor networks, and analyze performance in real time. You can collaborate on customer needs and engage with them through an omnichannel platform that makes every touchpoint personalized, easy, and relevant.

Together, these capabilities enable you to:
- **Improve segmentation and targeting**
- **Deliver greater personalization**
- **Increase customer satisfaction and loyalty**

Learn more

How can you deliver individualized experiences through multichannel marketing? Explore how SAP marketing Cloud can help.
This is a digital turning point for the oil and gas industry. Find out more about how SAP and IBM can support your business at every stage of the energy value chain.

In today’s volatile oil and gas industry, the winners will be those companies that have a coherent digital vision with clearly articulated strategies and a focus on business outcomes. SAP envisions a demand-driven value chain operating as a digital energy network that has the resilience and adaptability needed to thrive within any new and developing energy market.

To help oil and gas companies meet these new challenges, SAP and IBM have brought together their robust and secure infrastructure, industry-leading software, and best practices captured through decades of working together.

To find out more about tapping into this experience and expertise, please get in touch today.
Contact Us

For further information about how we can help you, please visit:

- SAP solutions for the utilities industry
- Digital Transformation with IBM and SAP
- IBM solutions for SAP applications for energy and utilities
- IBM Energy and Utilities Industry

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