Drive Performance in Upstream Operations

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Learning Points

- Improve operational performance of upstream assets
- Integrate operations across many business functions
- Close the loop through data gathering and analysis, decision making and execution
- Possible with applications and technology that is available today.
Reliable access to energy sources is driving world economic growth and elevating the standard of living of the burgeoning middle classes. To maintain this growth, prudent development of oil and gas resources is key.

Prudent and cost-effective development of all available energy resources provides a foundation for economic growth and helps the world run better. This requires coordinated planning, development, and operation of complex capital-intensive programs and assets across a full range of regulators, resource owners, investors, partners, suppliers, and ultimately energy consumers.
SAP Strategy for Oil&Gas – Driven by Industry Priorities

Industry trends

- Capital Investment Continues
- Increasingly Complex Assets
- Shifting Market Dynamics
- Dynamic & Diverse Energy Policies

SAP portfolio

End-to-end solutions for industry priorities
Today, upstream operations bring together many technical disciplines and business functions that are loosely connected. The challenge is to support a closed-loop view, leveraging a common platform for operations and maintenance, to enable you to gather, analyze, decide, and execute across the many elements that drive performance of assets at different lifecycle stages.

- Loose connections
- Disparate elements
- Multiple views

17%

Higher return on assets where asset management systems are fully integrated with inventory management, MRO purchasing, engineering and finance

Source: SAP Performance Benchmarking
Benefits

- Increased operational insight
- More accurate production planning
- Better visibility of profitability
- Improved production uptime
- Reliable day by day planning
- Reduction time and cost for procurement

Integrated Digital Oilfield Operations

- Manage the convergence of production, maintenance, engineering, and financials at all levels of the enterprise
- Increase transparency over all processes and across all functions. Close the loop between decision making and execution in the field.

Field Data Capture and Surveillance
- Data Collection and Validation
- Data Surveillance
- Data Governance

Integrated Planning and Performance Analysis
- Production Network Modeling
- Production Allocation
- Integrated Planning
- Performance Analysis

Field Execution
- Operator Company
- Service Company
- Resource Scheduling
- Field Confirmation

Hydrocarbon Accounting
- Revenue
- Land and Lease
- Joint Venture
- AFE and Asset Management

Applications
- Field Data Capture (with MII & Syclo)
- Upstream Operations Mgmt
- Hydrocarbon Accounting with PRA and JVA
- Real Estate Flex with Land Use Management

Analytics
- UOM Embedded Analytics
- UOM GIS integration

Mobile
- Operator Rounds by Syclo
- Safety Issue Management
- Visual Enterprise Viewer
- Mobile Plant

Cloud
- SuccessFactors Learning
- Ariba Business Network

Database & Technology
- Production Loss Analysis
- Well Work-over Profitability
- Seismic Noise Reduction
- Event Stream Processor
- Predictive Analytics

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Streamline data collection, validation, surveillance and notification processes from field systems and engineering applications

Provides an integration platform that delivers both operational intelligence and field system & engineering application integration for improved operational performance.

SAP brings real-time data from field systems for processing and analysis. This enables connectivity to field devices and automation, engineering applications, highly configurable content, and better quality and validated production data, such as process values, well tests and well downtime. With accurate and timely operational intelligence, upstream oil and gas companies can make more informed decisions to improve operational performance management.
Integrate production, maintenance, engineering and planning to ensure the right data and processes by the right people at the right time for optimum decision making

By integrating production, maintenance, engineering and planning activities, SAP enables a more holistic view of assets. As a result, they can improve operational decision making, reduce production loss, and maximize asset utilization through better production planning and more flexible and robust production allocation processes.

By providing a robust allocation engine that’s integrated with production planning processes, SAP supports processes support activities such as hydrocarbon delivery system modeling and what-if scenario planning, for improved visibility into planned and actual production data in order to enable the enterprise-wide performance of analyses to evaluate operational data results, integrated multi-dimensional planning & forecasting.
Streamline interactions between operating and service companies when executing in the field to meet production and net revenue targets, while meeting safety and environmental standards

Operators must ensure that field personnel – whether operator, contractor employees, or contractors – can easily, efficiently, and accurately order, schedule, deliver, and confirm operational services. Ordering oilfield services, coordinating and confirming their delivery, and processing and paying invoices often rely on manual processes. Operators concerned with maintaining safe, environmentally-compliant operations need to know that all staff on-site have proper training and certifications, and are aware of and compliant with the standard operating procedures the operator has established.

Both operators and service companies must reduce time and effort required for ordering and delivering field services. They must schedule crews and equipment to maintain maximum production while reducing operational costs. They must enable communications to confirm activities between the field and the field office. And they must reduce the cost of creating, processing, and paying for these services.
Streamline business processes for the production, land, gas control, and financial functions of an upstream production company

SAP streamlines upstream hydrocarbon production and financial processes where hydrocarbon accountants can increase visibility into production and allocation data, reconcile venture accounting and partner billing issues, and support legal and regulatory compliance. They can improve cost transparency, production distribution, and cash call management, for a faster and more accurate financial close. By maintaining accurate accounting records and calculating partner expenses and distributions according to the ownership agreement, companies can comply with production sharing and revenue agreements, royalty reporting requirements, and timely invoice handling.

Land management can integrate processes for increased visibility into land and lease contracts. As a result, land and lease managers can keep track of lease renewal dates, maintain producing properties, and work with Exploration to ensure on-time lease payments and renewals. And this can help them extend opportunities for mineral ownership and right-of-ways needed for exploration and development activities.
SAP Upstream Operations Management (UOM) is built on ERP and integrates field data capture, production planning, “what-if” planning scenarios, production allocation, maintenance, reporting, analytic, and GIS capabilities to enable Upstream Oil & Gas companies to improve decision making related to hydrocarbon production operations. It extends the functionality in core modules, like Plant Maintenance and joins it with new functionality that delivers a solution that closes the decision loop and eliminates the barriers to integrated upstream operations.
What If Planning

Active Status

What-if Status
Embedded Production Dashboard

Production Management

KPI Scorecard - Monthly

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<tr>
<th>Metric</th>
<th>Actual</th>
<th>Planned</th>
<th>Variance %</th>
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<td>Oil Volume</td>
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<tr>
<td>Maintenance Order (No. of ord)</td>
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Time series analysis

Produced Water

Daily production volume (DPV)

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Bad actor report – ranked by production

Higher priority, ranked on production and downtime
Work-over Profitability

GAS_REVP, GAS_PROJREV, GAS_REVA and GAS_NETREVCUM by PROD_DT where SIM_ID is SIMOPT where CAL_YYYMM is 201202, 201203, 201204, ... (3 more)
End-to-end Operational Scenario

- Gather Data
- Analyze Data
- Make a Decision
- Implement the Decision
- Analyze Results of the Decision

Operational Efficiencies Gained in each Step

Improvements Enabled by New Technologies:

- Mobility
- HANA
- Predictive Analytics & Visual Intelligence
- Applications (UOM, PRA, Syclo, Work Scheduling and Optimization, Procure-to-Pay, ORM)
Field office reviews performance of all the wells to see if issue is impacting other wells. A request to examine all underperforming wells is executed and it is determined that they are filling up with liquid.
To understand the impact of the liquid loading, the well operations for a specific underperforming well is examined over the last 90 days. As production volumes from the impacted well has been on a steady decline, a swabbing operation is suggested pending management approval.
Maintenance quotes from local contractors as well as the current gas price is loaded into the simulation to calculate the Payout Date based on the swabbing operation for the Well.

The Payout Date is satisfactory to management and the swabbing operations are approved and resulting work orders are created.
We will move beyond the technical disciplines and business functions that are loosely connected in upstream operations and drive a closed-loop view, to gather, analyze, decide, and execute to drive performance of assets at different lifecycle stages.
• Improve operational performance of upstream assets
• Integrate operations across many business functions
• Close the loop through data gathering and analysis, decision making and execution
• Possible with applications and technology that is available today.
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