Natural Supply Chains
A New Strategy for High-Performing Oil and Gas Companies
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EXECUTIVE SUMMARY

Supply chain costs make up about 80 percent of capital and operating expenses for upstream oil and gas companies. Although supply chain cost-cutting programs are a popular notion, few companies understand how well their supply chains align with the needs of their businesses and, thus, how to position their supply chain organizations to deliver maximum value. Consider a new approach—something we call natural supply chains. Natural supply chains exist across business units and are made up of business activities that have inherent similarities based on their respective requirements. Once a company’s natural supply chains are identified, the supply chain organization can be tailored to meet the distinct needs of each. An appropriate set of capabilities—roles, processes, and tools—is matched with the requirements of each natural supply chain to provide a customized solution that maximizes value. With this approach, performance across all important measures, including supplier reliability, supplier risk management, project completion, and costs, can be improved by 20 percent.
Oil and gas companies are going through the down part of their cyclical business, and as usual, their supply chains are feeling the heat. As lower commodity prices, declining productivity, less accessible reserves, and accelerating costs across operations dampen margins significantly, many oil and gas firms are taking a predictable route: They are looking to their supply chains to help close the profit hole.

In many ways, there are good reasons for this. Supply chain costs—mainly materials and services provided by third-party suppliers—represent upward of 80 percent of costs for oil and gas companies, and these costs are on the rise. Moreover, oil and gas prices are expected to be flat for the next 18 to 30 months, primarily because the demand for motor fuels and power generation will likely remain stagnant while the supply of refined products and natural gas stays high due to increased drilling activity. But though supply chains are, indeed, a viable target for cost cutting and efficiency improvements, most oil companies are ill-equipped to take the big-picture steps that would improve supply chain performance and maximize supply chain gains throughout the organization over a sustained period of time. Instead, they tend to swing pendulum-like from supply chain decentralization to centralization and back, depending on business conditions.

Typically, oil and gas companies have a half-dozen or so profit and loss centers or business units, each with its own supply chain needs. When times are good, companies tend to favor decentralization, giving managers in the field a great deal of flexibility to oversee and implement their own localized base of vendors. In these periods, the focus is on rapid growth and taking advantage of potentially strong revenue streams by letting the disparate units of the company move quickly to set up an operational structure that suits local drilling and capture characteristics. Though this is often a good way to be aggressive about oil and gas projects, supply chain planning and cooperation among different field locations and P&L centers—cost-consciousness in general—are effectively scuttled. Such lack of discipline in supply chain management can lead to 10 to 15 percent of cost creep into operations each year.

As a result, when the energy business weakens, oil and gas companies immediately try to pull back on the excess costs that have infiltrated the business units. Management initiates a one-size-fits-all, centralized supply chain structure. And though total decentralization was certainly not the right answer, this, too, fails to deliver as hoped.

By micromanaging details such as which type of equipment can be purchased from which suppliers and under what terms, as well as how much inventory must be at each site or warehoused at any given time, companies introduce tremendous complexity into the operations, resulting in poor service levels and high implementation costs and eliminating any gains from globally sourced contracts.

These additional costs tend to bleed in when field personnel, in desperate need of supplies or support services, ignore the global agreements (if they are even fully aware of them) and sign back-channel deals with suppliers, which do their best to up-sell additional high-margin products and services to the local teams. In time, the pressure builds throughout the organization to decentralize supply chains. And when markets rebound, companies are often willing to do just that—introducing a new set of inflationary costs into the system and completing a reversion to “boom” conditions marked by a “bust” procurement cycle.

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NATURAL SUPPLY CHAINS

To sidestep this expensive and ultimately harmful pattern, companies really have only one choice—adopting a concept that we call the natural supply chain. Under this approach, integrated energy companies can be broken down into a handful, not hundreds, of different but similar groups of business activities—conventional and unconventional exploration and production (E&P), refining, pipelines, supply and trading, retail gasoline marketing, and aviation fuels marketing, to name a few. Though there are many elements that can be leveraged across the enterprise, each group of similar business activities has unique requirements that must be met, and thus each has special supply chain needs. The key to success is establishing the right structure for each supply chain to ensure the best balance of centralization and decentralization; the goal is to identify the natural supply chains that stretch appropriate capabilities—roles, processes, and tools—across the enterprise. The ultimate aim is to scale common supply chain activities that can deliver cost and value advantages, while customizing supply chain capabilities to exploit specific needs and potential in individual segments of the portfolio.

For example, some projects, such as upstream oil sands exploration and midstream gas to liquids projects, resemble major construction efforts and require similar supply chain functions or capabilities to support enhanced project management and sophisticated logistics in a moderate-margin environment. These capabilities are best leveraged and shared across traditional business unit boundaries to take advantage of internal best practices and reduce both costs and large-project risk.

On the other hand, conventional and unconventional E&P projects have different business needs and require different levels and types of supply chain support. In conventional projects, given the irregular nature of well design and the relatively limited resources needed to squeeze as much out of the asset as possible, the planning focus must be on high-level technical support that emphasizes substantial volume output. By contrast, unconventional reserves are more homogeneous, and diving deeper for incremental gas is almost never profitable; as a result, rig productivity is paramount. Hence, one supply chain requires customization, while the other demands standardization and low cost.
 STEPS TO TAKE

In our view, companies that tailor their supply chain organization to meet the needs of their unique natural supply chains will have a 20 percent performance advantage over competitors that ignore this approach. There are three phases to implementing a natural supply chain:

1. Identify the Company’s Natural Supply Chains.

As noted above, a typical oil and gas conglomerate could have five or six separate business activities; indeed these may be multibillion-dollar P&Ls that have their own stand-alone competitors. By identifying these business activities and determining which have inherent similarities based on their supply chain needs, management can determine the precise level of supply chain capabilities required to meet the needs of each natural supply chain at the best total cost. In essence, it’s a market-back approach: If I were running this business unit as a stand-alone outfit, what would I need from my supply chain to maximize profitability?

For example, a service station with a convenience store is typically a low-margin operation, making perhaps 5 cents a gallon for gas and pennies on the dollar for retail purchases. The limited profitability of the business would be completely eroded if this service station had to bear the costs of a sophisticated IT network to track sales or a high-level logistics program for shipments. In this case, perhaps a basic ERP system, a shared resource handled by a corporate IT department, would suffice and be relatively inexpensive to implement. The more advanced technology and logistics applications should be reserved for more complex, higher-margin activities like an upstream oil and gas drilling project.

Most companies neglect their natural supply chains and instead settle on providing too much or too little capability, hurting corporate performance either way. Not wanting to overspend, they may purchase a not-too-expensive IT system to be installed throughout all of the business lines. But for the convenience store business, it’s overkill, and for the upstream business, it’s not good enough. In other words, while trying to save money, management has introduced into the supply chain a new layer of inefficiency and spread it across the company’s entire set of operations.

Oil and gas companies typically have four natural supply chains (see Exhibit 1):

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### Exhibit 1
**Types of Natural Supply Chains**

<table>
<thead>
<tr>
<th>NATURAL SUPPLY CHAIN</th>
<th>ATTRIBUTES</th>
<th>ACTIVITY EXAMPLES</th>
<th>SELECTED SCM IMPLICATIONS</th>
</tr>
</thead>
</table>
| Projects             | - Discrete one-time activities  
                      - Require high levels of technical planning  
                      - Often high cost driven by high complexity | - Conventional drilling  
                      - Gas plant construction  
                      - Initial drilling operations in new plays  
                      - Pipeline construction | - Contracting and supplier management approaches tend to vary widely  
                      - Supplier development and monitoring of market dynamics  
                      - Painstaking coordination needed to mobilize suppliers to meet specific project requirements |
| Programmatic Activities | - Activities are homogeneous, but scope and specifications are variable  
                      - Planable activities, though not necessarily with stable schedules | - Unconventional drilling  
                      - Recompletion and workovers  
                      - Compressor overhauls  
                      - Pipeline integrity testing | - High level of supplier relationship management  
                      - Management of scope for supplier activities to ensure optimal productivity |
| Routine Activities | - Planned and repeatable activities with well-defined scope and specs  
                      - Require consistency in execution to ensure requirements are met | - Production operations  
                      - Preventive maintenance  
                      - Meter test and calibration  
                      - Facility upkeep | - Utilization of materials and services  
                      - Sourcing focus is on price per unit  
                      - Supplier performance measured primarily around delivery |
| Emergent/Reactive | - Unpredictable activities that make planning difficult due to inconsistent rate of occurrence  
                      - Often time-critical due to impact on operations | - Unplanned production interruptions  
                      - Pipeline incursion  
                      - Facility damage  
                      - IT system interruptions | - Response time is typically more critical than price  
                      - High level of supplier readiness required because of critical timelines  
                      - Streamlined contracting process to facilitate rapid supplier response |

Source: Booz & Company analysis
Projects: Episodic and discrete one-time activities, such as conventional wells, development of new plays, and major pipeline construction. Corporate supply chain management (SCM) plays the role of project integrator, overseeing sourcing and the search for new suppliers, while the actual needs of the supply chain may be locally driven.

Programmatic activities: High degree of similarity each time the work is performed, though requiring some alteration in scope and specifications. Pipeline integrity testing, unconventional drilling, and employee services fit in this category. These activities require corporate SCM professionals who understand the uniqueness of each business segment and can manage the complex supplier relationships.

Routine activities: Planned and repeatable events with consistent scope and very few variations in the way they are performed, such as operations and maintenance, testing and calibration, and IT services. These activities should be served by a low-cost, efficient SCM process, where supply chain managers establish up-front category strategies for ordering routine materials—safety supplies, for example—and implement the processes and tools to make them easy to execute.

Emergent/reactive: Unpredictable events, such as damage caused by natural disasters and other unplanned production interruptions. SCM must be prepared to move quickly to tap into supplier emergency readiness, while acknowledging that response time is more critical than price.

Some companies don’t take the fit-for-purpose approach but instead make the mistake of always seeking best practices in every aspect of the supply chain, believing that pursuing excellence always improves performance. They couldn’t be more wrong. After all, there are about 40 different dimensions of supply chain capabilities—everything from warehousing to sourcing to category and inventory management, materials management, demand forecasting, and logistics, just for starters. Trying to drive best practices in each of these buckets would be an expensive activity and actually result in suboptimal performance in some business lines. For example, Walmart’s logistics program certainly qualifies as best practice, but it would be totally inappropriate for a deepwater drilling materials operation. Consequently, rather than chasing best practices in every capability dimension, oil and gas companies should use the concepts of the natural supply chain to clearly identify business requirements and link capabilities directly to these needs. This approach is less expensive and much more productive.

2. Develop Internal Capabilities Around Natural Supply Chains.

As an oil and gas company reconfigures its supply chains to match business requirements, internal process improvements needed to support the half-dozen business lines will become obvious. In many cases, operational inefficiencies derive from the separation between business units and, for example, the procurement function. But when natural supply chains have been identified, these silos can be eliminated and cooperation and coordination among the departments are possible. Among the most critical internal capabilities in an oil and gas operation are those that usually can be improved the most by ensuring

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that natural supply chains are up to the task of supporting business activities: project management; demand planning; supplier management; contracting and sourcing; and inventory management.

Because procurement has no real window into the operations of a business unit, project materials will typically be purchased on a relatively random basis—either when the procurement staff thinks they will be needed based on historical demand, though it can’t accurately predict future conditions, or when the business unit requests them, although often without a clear view of precisely how much is required. Because this approach almost never perfectly aligns to the precise needs of the business unit, project managers tend to protect themselves by ordering a lot of materials locally. They overbuy to avoid getting blamed for schedule slippage that occurs because procurement didn’t order enough steel or failed to make sure that the steel would be delivered on time. As we discovered at a major oil company, the result is 20 to 30 percent cost overruns due solely to poor project management and planning.

Supplier management plays a role most prominently in the use of services—maintenance, drilling, construction, and the like—which account for as much as 60 percent of the third-party expenditures made by oil and gas companies on big projects. Without appropriate planning—that is, without coordination through the natural supply chain—managing thecomings and goings of the contractors is impossible. As a result, at many oil companies, the standby time charged can be equal to the actual work time.

Most companies attack these individual failings at some point by suddenly focusing on the problem in a single business unit, while a new problem of similar importance is developing someplace else. Indeed, the only way to fundamentally root out these inefficiencies is to analyze each of the natural supply chains relative to the business lines that they support. And by integrating the work of the supply chain managers with that of the operational leaders, the knowledge and transparency gaps that produce the cost and schedule overruns can be closed throughout, say, all of the offshore projects in the organization and not just in a single project or a few in the same geographic area. Moreover, as much as building better capabilities is critical, eliminating the services that aren’t valued by a business line is just as important—and just as possible with a natural supply chain analysis.

3. Work with Suppliers to Align Better with the Natural Supply Chains.
Most oil and gas companies take the wrong tack with their suppliers. They focus on rates and, when they have

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leverage, demand deep cost cuts, but
they offer little in return. In response,
vendors simply wait for the cycle to
shift when demand rises and then
claw back concessions plus some
additional margin, or they work with
the field managers directly to up-sell
or spec a solution that is outside
the corporate agreement, ignoring
headquarters. Obviously, intended
savings don’t materialize. The
natural supply chain strategy offers
a path away from this deadlock.
After a company has cleaned up its
internal act by developing the right
capabilities tailored to its business
lines, it is perfectly reasonable to
work with suppliers to, for instance,
stop including 20 percent wait time
contingencies in their bids—because
there won’t be wait times.

This conversation doesn’t always
turn out as companies hope, at least
initially. Often suppliers simply don’t
believe that their customers have
actually changed. They instead see
this as a bait and switch: They’ll cut
their prices, and then the oil and
gas company will go back to its old
behavior, leaving the supplier at a
disadvantage. But with natural supply
chains, efficiency gains are actually
sustainable. And though it may take
a while for suppliers to be persuaded,
natural supply chains help them make
more money because they can utilize
their assets and working capital
with more certainty and consistency,
knowing what their customers’ needs
will be.

Viewed broadly, there are three types
of new supplier relationships that can
erange from a natural supply chain
strategy: differentiated service offer-
ings that reflect the distinctions in
the natural supply chain; closer levels
of integration between customer and
supplier; and flexible contract struc-
tures and incentives. Most important,
in each of these aspects of dealing
with suppliers, one-size-fits-all rela-
tionships are no longer acceptable.

By contrast, a conventional drill-
ing project will require a different
relationship with the supplier. In this
case, the company and the supplier
would work jointly on high-level
equipment and resource customiza-
tion, with frequent design changes
depending on the factors at the site.
Together they would create a plan to
get the most oil out of the well even
though the costs and intensity of the
effort may outpace those of an uncon-
tventional project. Though the two
cases are quite different, they have in
common distinctive service offerings
and greater collaboration.

Through the application of natural
supply chains, SCM can plan for
a base level of demand for similar
activities across the company. With
the supplier agreeing to meet this
demand—for example, 20 wells in
the course of a year—at an agreed-on
cost structure for a defined period
of time, natural flexibility is built
into the supply base. Through this
arrangement, the company enjoys the
benefits of predictable pricing and
the ability to deploy the supplier’s
resources when and where they are
needed during the year. In return,
the supplier is able to count on a
steady stream of business over the
same period.
When it comes to supply chains, one size clearly does not fit all. Instead, natural supply chains, which involve essentially customizing supplier relationships to suit the needs of the business line rather than the constraints of the overall organization, are a more organic and, indeed, optimizing approach. Supply chain costs are reduced, non-value-added activity is diminished, and because companies are more in touch with their customer and supplier bases as well as the requirements of the business lines to operate at peak efficiency, risks are managed and controlled. The differences between, for example, unconventional and conventional drilling projects are addressed with natural supply chains in a way that maximizes gains and limits the downside. And in the oil and gas industry, that in itself would be a distinction that makes a real difference.
KEY HIGHLIGHTS

- Current market conditions have compressed oil and gas company margins as demand for natural gas remains flat, market prices remain low, and drilling activity continues to increase in new shale plays. At the same time, the availability of contractors and suppliers has not kept pace with the escalating demand for their services, particularly shale drilling operations, and factor costs are on the rise. As a result, supply chain organizations are being pressured to deliver greater value that companies can take to their bottom line at a time when forces are lined up against doing so.

- Natural supply chains, composed of business activities that have similar characteristics, cut across business units and different lines of business.

- Successful supply chain organizations have been able to deliver additional value by tailoring their capabilities to meet the unique needs of the distinct natural supply chains inherent within the organization. To be effective, capabilities for each natural supply chain need to follow a fit-for-purpose model across three key dimensions—roles, processes, and tools.

- By aligning the supply chain organization to natural supply chains, and scaling capabilities to meet their specific needs, companies can gain a new flexibility in their supply chains with additional cost and value benefits that routinely translate into organizational bottom line improvements of as much as 20 percent.

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