

Petoro Leverages Smart Operations

Capgemini assists Petoro in performing readiness assessment to gain tangible benefits through Smart Operations practices on the Norwegian Continental Shelf

The Situation

Petoro manages commercial aspects of Norway's direct involvement in petroleum activities on the Norwegian Continental Shelf (NCS). The primary objective is to maximize economic value of the oil and gas portfolio for Norway. Petoro adds value by identifying opportunities to enhance working methods of individual operators and coordinates projects between operators to ensure consistency and cohesion.

The NCS is a mature oil and gas region facing declining production, increasing operating costs and reduced investment. It also has one of the highest labor costs in any global oil and gas region. To counter these, Petoro sought new ways to make development of remaining reserves more economical.

"Smart Operations"—making oil and gas fields "smarter" by improving efficiency in off- and onshore work processes through the use of IT and operational best practices—was a strategic goal.

The Solution

Capgemini has served the Norwegian Oil and Gas sector for over 30 years. This was exactly the kind of maturity and expertise that Petoro wanted in its partner to ensure assessment success. The solution was addressed in two parts:

Company Level Survey

The two teams launched a pioneering effort in 2004 to gauge the "Smart Operating" readiness of major operators in the NCS. Operator

“ Integrated Operations is one of the industry's “hot-spots.” Norway is today a leader in harnessing its potential, and is fast becoming a truly networked industry and building the capability for Second Generation IO. According to our latest survey with five operators in the NCS, it is estimated that a value creation in the order of NOK 15 billion could be attributed to IO in 2006. ”

Roy Ruså
Technical Vice President
Petoro AS



roadmaps were developed and applied by gaining insights into other operators' experiences and established leading practices.

Two years later, Petoro and Capgemini launched an initiative to assess progress as well as identify leading practices to further evolve the transformative shift. This was followed a year later to accelerate the uptake of leading practices and delivery of benefits in the NCS.

"Smart Operations", referred to in the NCS as "Integrated Operations" (IO) is a broad categorization of strategies to integrate real time data, technology and operational work processes. It includes many related improvement initiatives among major global producers—Smart Fields, i-Field, e-field, etc.

The Result

A Petoro survey in 2007 gauged the readiness of major operators in the NCS for IO practice deployment. The study provided tangible evidence that IO is transformative, delivering significant gains in upstream performance in the NCS with respect to cost reduction, work process efficiency and volumetric improvement. Thanks to IO, the NCS represents the most well networked group of operators in the world. As a consequence, Norway is a leader in harnessing the full potential of IO, fast becoming a truly networked industry benchmark building capabilities for Second Generation IO. The tangible benefits of IO are in:

- prevalence and maturity of purpose built operations and drilling centers
- emergence of truly networked NCS organizations
- allowing broader collaboration virtually anywhere, by anyone and at anytime
- better on-offshore communication and true multi-disciplinary collaboration
- allowing access to key competencies and decision-making through

integration of real time data, technology, and operational work processes

- easy location of decision making through redesigned work processes
- allowing operators to develop new and fundamentally different ways of conducting business—IO@anywhere
- providing in-depth sector-specific knowledge, best practices and global thought leadership for operators.

IO has allowed the NCS to build a new organizational capability to optimally harness the potential afforded by rapid emergence of proven tools and techniques, albeit, within the constraints of asset capacity and organizational culture. It is multi-faceted, interweaving people, process, technology and cultural dimensions. It is also fast, being recognized as a true capability aligned to the NCS operators' ability to find, develop and produce oil and gas.

How Petoro and Capgemini Worked Together

Capgemini responded to the challenges by drawing on its extensive knowledge and experience from previous benchmarking studies and an Upstream Center of Excellence. The project was divided into two key phases.

Considering the status of Smart Operations implementation and maturity in mid 2004, Petoro wanted to test the readiness of various operators in the NCS with respect to the deployment of "smart" operating practices in Drilling & Well Operations, Reservoir Management & Production Optimization, and Operations & Maintenance.

The first generation of IO focused on necessary experimentation and proof of concepts to build the foundation for a shift to IO practices instituted in 2004. The joint teams began the task of seeking interest from operating companies in Norway and designing a survey tool to collect, analyze and present the data.

The scope of the survey was comprehensive, covering Strategy, People, Process and Information & Communication Technology (ICT) parameters. Two detailed interview guides were prepared, designed to extract information relating to IO strategies, organizational and program governance, technologies and determine leading smart practices. These provided a framework for interviews with over 50 industry experts from both operating, and oil & gas supply/service companies. The survey was designed as a self assessment tool to gauge the maturity, operator uptake and implementation of IO.

A select group of representatives from both operators and suppliers was invited to a workshop to validate the questionnaire. Due diligence in the form of targeted interviews was performed on responses to validate the data. Leading practices across the targeted value chain were identified as a consequence.

Operators focused on developing an ability to improve collaboration between onshore and offshore, shift work processes and decision making. Numerous tools, technologies and new practices were tested and proven, and significant benefits were attained. These included improvements in onshore/offshore collaboration, deployment of multi-disciplinary teams, visualization tools and work process redesign.

The change was most visibly evident in the development of purpose-built onshore operations and drilling centers targeting specific NCS assets. There was significant focus on change management, culminating in development of purpose-built, asset-focused onshore centers. Typical practices in the phase included:

Experimentation (Initiate Phase)

- test and select single point solutions
- demonstration of value creation
- field proof-of-concepts

- wellhead/wellbore data integration with technical applications
- alerting personnel and equipment
- new data transmission technologies
- audio visual collaboration tools
- data flow management.

Integrated Operations (Building Competency)

- aggregate solutions across assets and fields
- formal redesign of work processes between onshore and offshore
- real and virtual team collaboration centers and decision making around integrated reservoir models
- development of new enabling IO technologies.

Second Generation IO: IO@anywhere

The First Generation model typifies much of the IO effort in the NCS but has evolved to such a degree that it has become “business as usual” for most NCS operators. It was a major step change in how work is traditionally organized.

Although challenging for many operators’ organizational models and culture, the success of these efforts set the stage for a second wave of transformation. In that phase, IO was driven by an overarching focus on broad collaboration, creating an opportunity for a fundamentally new work environment within the NCS.

A survey in 2007 revealed significant variations in IO strategy among NCS operators. However, the most important difference between operators in realizing IO benefits was individual abilities to execute a given strategy within the context of specific organizational capabilities and asset capacity. The primary drivers of IO strategies reflected fundamental issues facing a mature NCS, including continual focus to increase production, extend reserves and reduce cost (the last element did not seem to be a primary driver for some operators).

Taking these findings into account, significant progress has been made in all major aspects of the value chain including Drilling & Well Operations, Production Optimization & Reservoir Management, and Operations & Maintenance.

Cultural and operational differences are now more discernible in how IO strategies are deployed. For some, there remains a need to continue to build sound business cases, gain management support to access resources and adhere to a more prescribed delivery process.

Others have more fully accepted IO practices as “business as usual,” and expended effort to implement proven practices, empower the organization to experiment and innovate to



develop even newer applications and work processes. The key factor behind success in this phase was the joint team's focus on not just the deployment of new technologies, but placing an equal or even greater emphasis on people and process changes. Resulting benefits of the second phase are characterized by:

- multi-business unit asset integration
- cross-company standardization of practices and work processes
- streamlined data flow and reporting
- integrated, real-time well, seismic, reservoir and geologic modeling
- efficient use of competence by allowing easy access to experts via linked centers and virtual teams
- sophisticated predictive field performance algorithms
- truly networked operators with broad collaboration from virtually anywhere.

Overall, the uptake of IO practices in the NCS has accelerated significantly since the initial survey in 2004, as indicated by findings of the latest survey in 2007. Integrated Operations is no longer the future; it increasingly reflects the current state of upstream business in the NCS. Despite that, IO remains "work in progress" for the joint team; the full potential is yet to be realized broadly across the NCS. Collaboration between Petoro and Capgemini continues so that operators can be led towards the next evolution of IO in the NCS.



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More information is available at www.capgemini.com.

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Petoro manages all commercial aspects related to Norway's direct involvement in petroleum activities on the Norwegian Continental Shelf (NCS). Its primary objective is to maximize economic value of the oil and gas portfolio for Norway. Petoro serves as the licensee for the

state's direct financial interest (SDFI) in Norwegian petroleum operations. The company has the same rights and obligations as its partners in production licenses and other partnerships. The SDFI portfolio managed by Petoro is the largest on the NCS, embracing 90 production licenses and 18 partnerships/companies. These holdings represent more than a third of Norway's petroleum reserves and over a quarter of total Norwegian oil and gas production.