

Application enables customizable workflows

New SDK allows the oil and gas industry to innovate on the fly.

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Oil and gas companies require innovative software technology customized to solve the complex problems associated with fractured carbonates, deep water, subsalt, and shale gas plays. Yet the industry has been relatively slow, compared to other industries, in moving technology from R&D through testing and into users' hands. As the industry looks to solve these challenges, operators must differentiate themselves from their peers through the use of leading software solutions.

With companies now working complex and unconventional reservoirs, software applications need to evolve more quickly than before. Many of these reservoirs have challenges that require specific, customized software technologies. Historically, service companies often were unable to update commercial applications fast enough to meet industry requirements, while proprietary software developed by energy companies was difficult to integrate and maintain. What is needed now is a solution that allows developers to accelerate the development of innovative software solutions on the currently deployed commercial release. As opposed to waiting months for new software developments, innovation now is required in days, hours, or minutes. Instead of reinventing code, developers require a solution that allows them to focus on the science to address the complexities encountered with specific reservoirs and do so as quickly as possible. These solutions must be deployed immediately without having to wait for the next release.

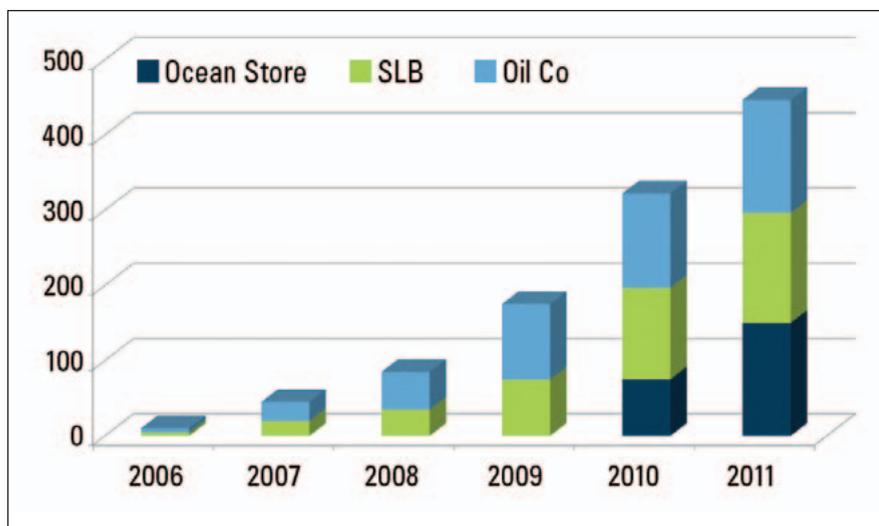
Ocean of innovation

Petrel seismic-to-simulation software pro-

vides a robust platform that allows geoscientists and engineers to create and simulate complex 3-D models of oil and gas reservoirs.

Software developers need access to the Petrel programming interfaces so they can introduce new science for geoscientists and engineers. Developers also need to deliver these capabilities quickly, in time to impact key exploration or development decisions. Similar to how iPhone users are customizing their

Petrel experience. The completely open framework allows developers to get inside the Petrel application to add the required science, from well-pattern design capabilities to drilling visualization to a proprietary inversion algorithm. Users no longer have to wait for the next Petrel release. Instead, they can work with their developers to create plug-ins to meet specific challenges on the Petrel release currently in use within their company.



There has been dramatic growth in the development of Ocean plug-ins. (Images courtesy of Schlumberger)

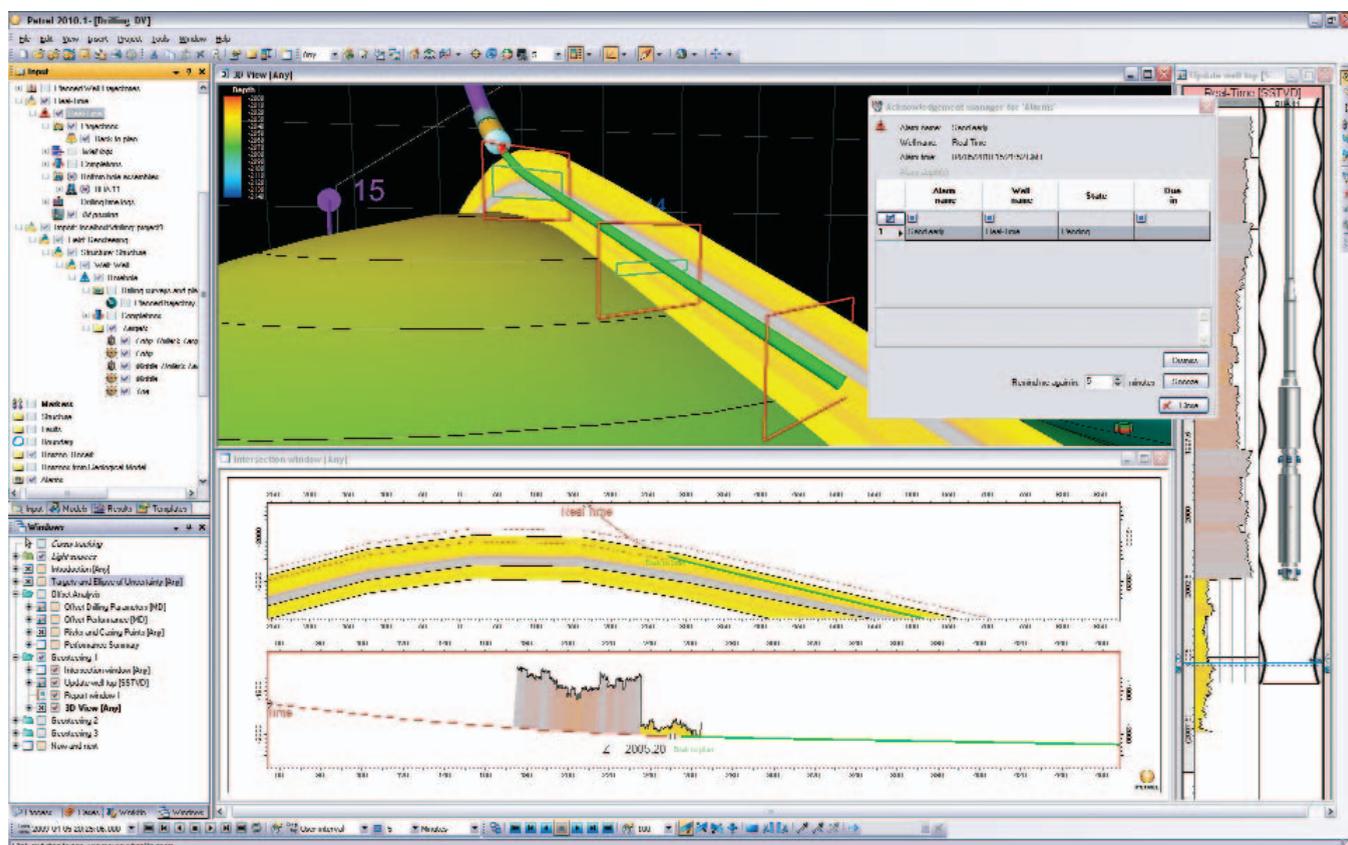
mobile phones based on their specific needs through the use of apps, Petrel users require the equivalent of apps to customize Petrel workflows. Using the iPhone software development kit (SDK), developers can create applications to enhance the iPhone.

With Ocean SDK, software developers can customize Petrel to meet their users' unique requirements. Based on Microsoft technology, the Ocean framework accelerates the development and deployment of innovative software solutions.

At its core, Ocean enables users and developers to build code to enrich the

Community of innovation

What makes the iPhone unique is the ecosystem that has evolved around it. Anybody anywhere in the world has the ability to create an iPhone app. With Ocean, an ecosystem also has developed comprising software companies, universities, and oil and gas companies. This collaborative ecosystem facilitates a new approach and business model for developing and deploying software, enabling differentiation. This network ultimately allows innovation to move from idea to end user faster than before. The Ocean community is growing as the connec-



The Drilling Visualization plug-in allows users to create extrapolations from deviation surveys, predict upcoming events, estimate expected formation depths, monitor changes to model data, provide audible notifications, and run workflows. Bottomhole assembly and bit positions can be viewed in the context of Earth, improving the understanding of current operations and identification of drilling events.

tions among its members continue to increase.

Thus far, the Ocean SDK has been employed by 22 oil and gas companies as well as 30 software development companies and 19 universities throughout the world. Oil and gas companies now have the ability to create their own proprietary algorithms and applications for Petrel. This enables companies to quickly take ideas from R&D groups and deploy them globally.

Software companies are using this open framework to create plug-ins to integrate their capabilities into the Petrel platform. Oil and gas companies are using these integrated capabilities to create differentiated workflows. With Ocean, universities can focus their research on relevant industry problems, develop solutions, and quickly get them into the hands of petrotechnical professionals.

App store for the oil, gas industry

Much like Apple offers one central location to download apps using the App Store, Schlumberger provides the Ocean Store, a site where users can browse, download, and purchase Ocean plug-ins. The Ocean Store provides access to a growing set of capabilities that extend the Petrel platform. The plug-ins available at the site have been created by Schlumberger, other software companies, and universities developing on Ocean.

Since the launch of the Ocean Store in May 2010, the site has had more than 15,000 visitors from 95 countries. The store currently features more than 40 custom plug-ins to address a number of domains, from geology and geophysics to geomechanics, information management, and reservoir modeling. In addition to the domains, users also can filter the plug-in search based on

various themes such as heavy oil, deep water, or carbonates.

Bottomless Ocean

With the Ocean SDK and the creation and launch of the Ocean Store, borders and limitations to the extension of Petrel have disappeared. Oil and gas companies have the ability to differentiate like never before. They can innovate at will and implement these innovations based on their own timeline.

Although the oil and gas industry may not say, "There's an app for that," when referring to the complexities associated with the challenges of deepwater subsalt reservoirs, shale gas plays, or fractured carbonates, Ocean now allows for a new way to customize the Petrel software solution so that "there's a workflow for that." **ENR**