Success Story

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SGI and Landmark Graphics Corporation: Building the Visualization Business Model for the Energy Industry

Faster, Higher-Probability, and More Cost-Effective Decisions for Oil and Gas Companies

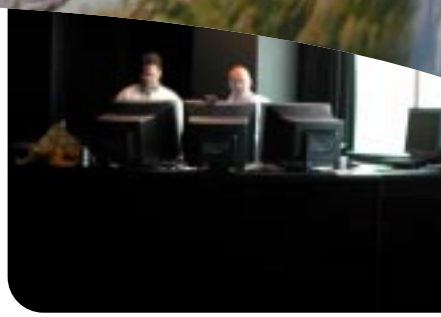
Exploration is an increasing challenge for any petroleum company today. Oil companies are moving into frontier areas considered off limits just a few years ago and drilling costs continue to rise. And as exploration databases grow, it becomes harder to integrate information from varying sources when making drilling decisions. This is historically the case partly because the process has been a linear process done in isolation within the various geoscience and engineering disciplines. In a typical scenario, a plan or concept with supporting data from a geophysicist is passed to a geologist, who passes it to a drilling engineer, who sends it to a reservoir engineer. Any of these people may hold up the plan for any number of reasons or send it back to another team member with suggested changes. The challenge for the industry is this: How can we get these team members together in a room, integrate their data into a single earth model, and enable them to interactively navigate through the data and collectively arrive at the best decision?

Landmark Graphics is filling this need with industry-leading visualization solutions running on SGI® systems. By visualizing data from several sources and displaying it in a SGI® Reality Center™ facility, the oil company can create an immersive environment in which an exploration team can arrive at a drilling decision in minutes or hours instead of days or weeks. Landmark is demonstrating this capability, which is marketed jointly in a variety of configurations by Landmark and SGI, at its Executive Briefing Center (EBC) in Houston. SGI Professional Services has just completed integration and installation of first-of-its-kind visualization technology at the EBC.

"We're using the visualization facility to demonstrate how our integrated suite of applications can enable asset teams to arrive at better decisions quicker," says Landmark Market Development Manager Lamar Traylor. "To give you an idea of its potential, the first immersive visualization demonstration we ever did was for a customer team looking at drilling possibilities on an offshore platform. They discovered, by trading ideas in the immersive environment, that they could reduce the number of wells they were planning to drill and achieve the same result. They estimated that this one decision saved them in the neighborhood of $18 million."

Creating a Cutting-Edge Immersive Environment

Landmark recently relocated its Houston headquarters to a new facility. Although the company had already been using Reality Center technology with CRT projectors to demonstrate its software capabilities, it wanted cutting-edge projection for the new EBC. SGI Account Representative Bev Taylor and Solutions Manager Scott Richardson drew up a proposal for an immersive environment that uses a large curved screen and Barco Galaxy DLP™ (Digital Light Processing) projectors to deliver brilliant large-scale images. The facility uses optical blending and the SEOS Mercator II distortion



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—John Mottershaw, IT Support Manager Landmark Graphics

correction system to adapt the projected images to the curved screen. "This is a first," says Landmark IT Support Manager John Mottershaw. "Nobody has ever done blended, curved-screen, active-stereo digital projection before."

Landmark approved the proposal in March 2002, and SGI Professional Services Project Manager Mark Stephens was given just eight weeks to complete the installation from a bare-floor start. The space has been designed to serve as an immersive meeting room that comfortably seats 12 people. Nevertheless, SGI had wiring and structural changes to make, including fixtures for the ceiling-mounted projectors and support for the big curved screen. The plan includes a nine-foot-radius curved control console at the rear of the room where a team member can drive the meeting using three stereo-capable CRT monitors. The experience can also be driven with a wireless touch panel from anywhere in the viewing area.

SEOS provided the display system components. The 20-foot projection screen, which is 10 feet tall with a 12-foot radius, provides a 160° by 40° field of view. SEOS technicians made the screen structure a permanent part of the facility, mounting and aligning the heavy, curved fiberglass panels, then filling, sanding, and painting to create a seamless projection surface. The brilliance and resolution of the graphic images created by the three 5000-lumen DLP projectors is remarkable. "The stereo data jumps off the screen," says Traylor.

A Powerful Decision-Making Tool

"Before we were ready for our acceptance tests, we had a request to demonstrate the system to the 15-member Landmark executive team, who happened to be together in Houston," says Stephens. "We were able to get Landmark software configured rapidly and put together a demo in stereo mode. The team arrived, sat down, and put on their stereo glasses. They were amazed at the brightness of the display. We could have had all the lights on in the room and still enjoyed a crisp, clear image."

The three DLP projectors are driven by a 16-processor SGI® Onyx® 3400 visualization supercomputer with three graphics pipes. The SEOS Mercator II, a new-generation distortion correction system designed to run at the higher video bandwidth of active-stereo DLP projectors, is used to warp the image to project properly on the curved screen. Together, with optical edge blending, the three projectors deliver an on-screen image of 3520x1024 pixels.

When the SGI Professional Services team completed its precision alignment of the projection system, the stereo effect enabled viewers to stand, walk toward the screen, look to the side, and study projected three-dimensional objects without losing the stereo image. Touch-panel controls permit the driver to change instantly into or out of stereo mode.

SGI Professional Services: Meeting Timeline and Technical Challenges

At the onset of the project, SGI Professional Services faced the double-barreled challenge of working on a tight timeline with new technologies. Landmark had dismantled its existing EBC as part of its move and was eager to replace it with the new technology.

"We had our kickoff meeting at the installation site on February 28," says Stephens. "We had a bare room to work with when we walked in, but it had to be modified to accept the system and provide power at appropriate locations. Eight weeks was very tight for this project. There were many risks involved because the technology was brand new—this was the first installation of these projectors in the United States. We had to ensure that the projectors were built and shipped on time. Then we pre-assembled and tested portions of the system off-site to make sure the distortion and blending were exact."

In spite of these challenges, the SGI Professional Services team was able to complete the physical installation of the SGI Reality Center facility and the projection and control systems almost a week ahead of schedule. They then worked closely with Landmark software developers and support engineers from the SGI Houston office to modify applications scripts so the data could be displayed effectively. The team ran its acceptance tests successfully and on time on May 1.

"The relationships you establish between contractor and customer can make or break any project," says Stephens. "We had great support from Landmark and particularly from John Mottershaw. They responded quickly to our queries and kept us moving forward at all times."

"The installation process was smooth," says Mottershaw. "The SGI Professional Services people were a pleasure to work with. Of course, there are always unforeseen problems with any installation, but we just worked through them together."

Landmark has already demonstrated its powerful new decision-making tool to teams from a number of interested companies. That makes it highly probable that SGI Reality Center systems will soon be installed at oil and gas exploration facilities worldwide.

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