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## Platform Driving Gains In Productivity

By Craig Hodges

HOUSTON—Oil and gas companies are overloaded with data, documents and information that make it difficult to make mission-critical decisions in real time.

To add to the problem, older workers—typically the knowledge holders of the company—are quickly reaching retirement age, taking with them years of invaluable expertise. Incoming workers, fresh from college, will be required to take on the hefty challenges that took older colleagues decades to master in a mere five to 10 years. Clearly, oil and gas companies face an urgency to capture this exiting knowledge and amplify the abilities of their workforce to perform with maximum ef-

fectiveness and productivity.

Peter Robertson, vice chairman of Chevron, said it best: "At Chevron, sophisticated computer systems are needed to manage the digital tidal wave of documents, spreadsheets and images that is growing by 60 percent a year. Chevron employees alone generate 1 million e-mails each day."

Large oil and gas companies also manage a level of complexity that can span thousands of desktops all over the world. They often have multiple information technology departments in various locations, using a variety of computing platforms running mission-critical applications and numerous types of hardware throughout the company. And operational

information originates not from company headquarters, but from oil fields located miles or even continents away.

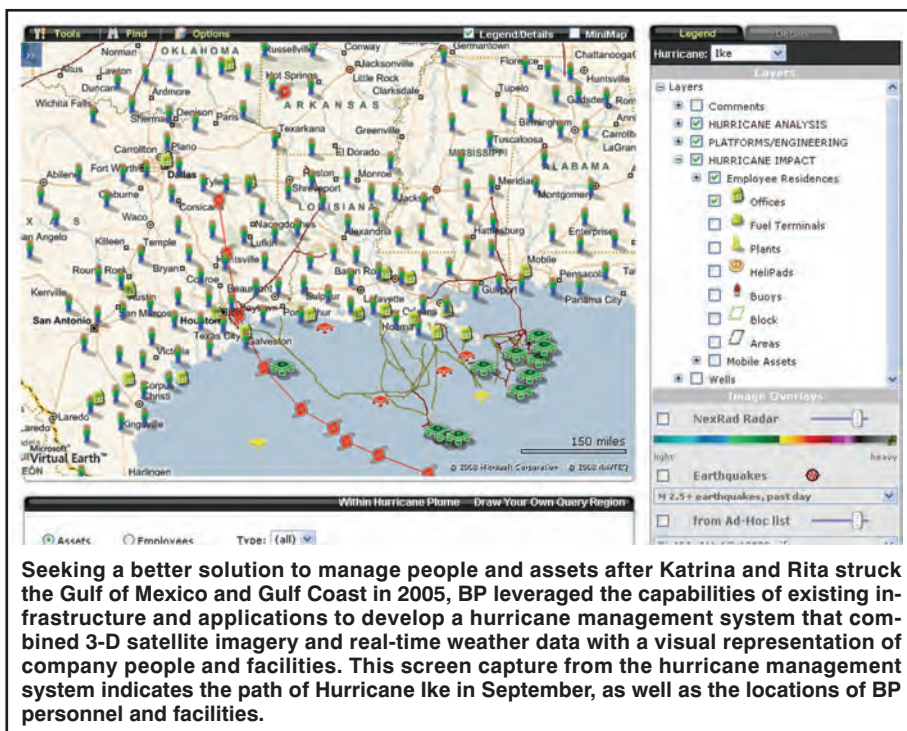
One way to amplify the impact of workers is to break down the information "silos" that impede collaboration and enterprise knowledge sharing, in essence creating an oil and gas world without walls.

### The Answer Is Integration

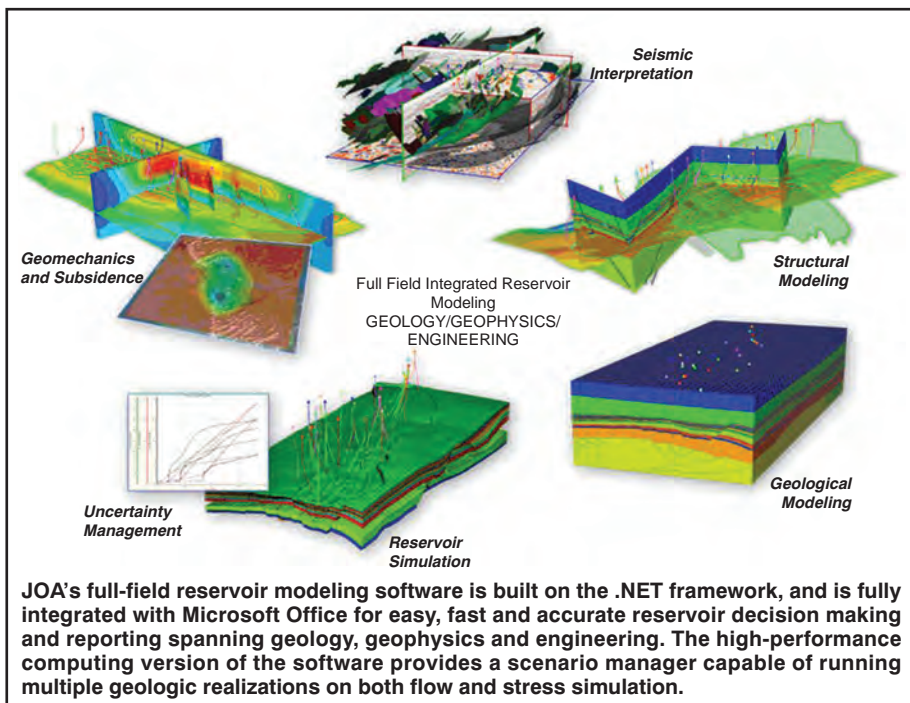
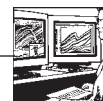
Important information resides in systems, documents and often in structured databases and unstructured files on employees' laptop or desktop computers. Companies that take an integrated approach to knowledge management have been able to transform the way their people turn information into business opportunities and growth, enabling a new level of information discovery and collaboration. Essentially, the integrated IT platform must align with how people actually work, giving them a transparent user interface and enabling them to connect seamlessly and securely to the back office.

This integrated platform also promotes information transparency, because information must be understood, classified and managed to meet health, safety and environmental, government reporting and compliance requirements. It improves enterprise content management by unifying document management into a rich data repository that can be mined in multiple ways.

In addition, an integrated platform improves workflows and leads to better decisions across the entire oil and gas value chain, from drilling to inventory to asset values (especially for mobile workers in the field). Finally, it provides the ability to create virtual work spaces where



Seeking a better solution to manage people and assets after Katrina and Rita struck the Gulf of Mexico and Gulf Coast in 2005, BP leveraged the capabilities of existing infrastructure and applications to develop a hurricane management system that combined 3-D satellite imagery and real-time weather data with a visual representation of company people and facilities. This screen capture from the hurricane management system indicates the path of Hurricane Ike in September, as well as the locations of BP personnel and facilities.



geographically dispersed teams can check in and out documents, track who changed what and when, and collaborate, creating a single version of “the truth.”

With respect to addressing these industry issues and enabling the capabilities inherent in an integrated platform, the latest-generation Windows®-based platform is capable of unifying communications, promoting true collaboration and providing the compute power needed from the smallest handheld device to the server clusters that tackle some of the industry's highest-end supercomputing challenges. A key goal over time has been to create the integration that produces the least amount of IT systems complexity.

What differentiates the Windows platform from other IT systems is that the core technology is globally pervasive, familiar to users and aligned with the way people in oil and gas actually work. One of the newest information technology offerings is the emerging software-plus-services capability, which includes a combination of on-premise software and hosted services, and anything in between. This new approach gives users greater flexibility in how they approach and deploy Windows platform capabilities.

Combining software plus services is a powerful concept that is well suited to today's business environment. Corporate IT departments continually look for ways to reduce complexity, and they are constantly asked to find ways to drive down

costs while driving up agility. Meanwhile, they have to help their organizations adapt to the realities of the global economy, meet the needs of an increasingly mobile workforce, and fulfill the requirement to integrate more easily with partners and suppliers. A blended client-server-services approach helps IT departments tackle these challenges with greater flexibility and efficiency.

And with a wide range of software, services and devices to choose from, the resulting technology can be as unique as each individual user.

### Going Mobile

With the proliferation of mobile devices in both our personal and professional lives, oil and gas companies have increased options for leveraging these devices to capture real-time near-field data anytime and anywhere. New mobile features are available today that enable the industry's mobile workforce to:

- Collaborate with colleagues with increased integration;
- Find, organize and use information more effectively with search capabilities; and
- Extend immediate and relevant information about performance and asset management to existing enterprise systems without ripping and replacing infrastructure.

At one major oil and gas service com-

pany, executives wanted to boost the bottom line by enhancing collaboration among engineers, operators, service coordinators and customers, and by improving resource utilization and other operations efficiencies. To accomplish this, the executives decided to give employees and customers more powerful mobile software solutions for making calculations in the field, sharing information and scheduling jobs.

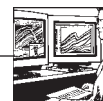
This produced applications for users working everywhere from the office to the refinery to onshore and offshore drilling environments. With this new functionality, staffers are designing strategies for drilling, cementing, workovers and other well operations, and are communicating such strategies in real time to their customers.

Increasingly, innovation in the area of mobile technology is creating next-generation capabilities that include near-field communications, device-to-device information capture, robotics and down-hole radio frequency identification capabilities. Now everyone in the oil and gas supply chain can pass and share data in real time, enabling them to make pertinent decisions faster and more accurately.

### Mission-Critical Applications

As the industry faces ever-growing operational complexities, the demand for more sophisticated software applications is stretching the Windows platform to newer and more innovative horizons. From managing multibillion-dollar capital infrastructure projects, to protecting offshore and deepwater assets, to providing the security required in today's multicultural and often divisive geopolitical environments, the platform is offering the computing power and flexibility to meet even the most challenging oil field requirements.

BP managed to protect its employees when Hurricane Katrina struck in 2005, but the process of locating its people and material assets and making decisions about their care was time consuming when every second counted. Seeking a better solution, BP developed a hurricane management system that combined the 3-D satellite imagery of mapping software and real-time weather data with a visual representation of BP people and facilities. This solution uses BP infrastructure within the existing application



environment. It saves BP crisis managers hours each day by automatically consolidating data from 20 sources.

Most importantly, BP personnel worldwide can understand and respond to threats hours faster, with the potential for material cost savings from better operational efficiencies.

Mission-critical applications also can be used to locate and present key performance data. Working for a Houston-based oil and gas company, Stonebridge, an IT consulting company, is developing a geospatial executive dashboard that presents key performance data visually using a map-based user interface. The “mashup” Web application, now in the proof-of-concept phase, integrates well information, production history and well tests, and competitive intelligence with visual layers showing fields, pipelines, facilities and other assets. This custom application, which also supports enhanced reporting and business analysis, is powered by the capabilities of Microsoft’s Virtual Earth™ mapping software and IDV Solutions’ Visual Fusion™ suite. It also utilizes advanced business intelligence capabilities from the Microsoft SQL server reporting services and .NET framework, charting components from Dundas Data Visualization.

Neither of these mission-critical applications would be possible without the end-to-end, integrated Windows platform that, underpinned by the .NET framework, allows universal interoperability among various software and services offerings. This degree of platform integration and scalability is crucial to the oil and gas industry, arguably the largest and most complex business environment in the world.

## Tough Business Climate

With wildly fluctuating commodity prices, an unstable global financial climate, and increasing competition for workers and field resources, oil and gas operators face the toughest business climate in decades. In order to compete effectively, companies must be able to look to their computing environments to help them do more with less, and in real time at the right price. No easy challenge, for sure, but operators are calling on the Windows platform to do exactly that.

Chesapeake Energy Corp., the leading natural gas producer in the United States, is a rapidly growing company that

tripled its employee headcount between 2005 and 2008. To meet the challenges of such rapid growth, the company needed a more powerful enterprise solution to boost worker productivity, improve workflow and enhance collaboration across the oil and gas value chain.

Using SharePoint server technology, Chesapeake developed and deployed a new solution that integrates the company’s intranet, extranet and Internet presence, and through its extensibility, streamlines collaboration across project teams—including teams with remote employees—to create a foundation for business intelligence applications, stronger content management and consistent communications with external stakeholders.

“Comprehensive information access is essential in the oil and gas production environment, which is awash in information from diverse sources and reliant on employees often working in very remote locations such as field offices and rig sites,” says Wade Brawley, Chesapeake’s vice president of land administration. “Now, through SharePoint sites, field-based employees can access the same information, with the same ease, as employees working at corporate headquarters. This is a real productivity booster.”

Timely and accurate data that reside in one place can enable predictive management of critical business issues. Chevron, for example, implemented a scalable Windows-based software platform that crosses organizational boundaries to manage the complete business decision cycle. This is achieved by extracting specific data and events from dozens of different sources, delivering them to appropriate people and business units, and enabling them to support continuous improvement across the whole of the business.

This integrated approach can potentially help most Chevron employees make better use of real-time intelligence in their everyday activities, and make a greater contribution to the business as a whole. The ability to integrate real-time data and business systems aims to improve the execution of informed business decisions exactly when and where required.

## High-Performance Computing

Oil and gas companies are using high-performance computing (HPC) to determine the value of reservoir assets through seismic analysis and to avoid drilling dry holes through reservoir simulation. This landscape is rapidly evolving, thanks to

the Windows platform’s high-end capabilities.

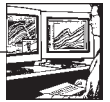
A 2008 survey shows that although most of the industry’s geoscientists and engineers have immediate access to the compute power they require, there is still significant room for improvement as computing needs grow more complex. Based on the survey results, 89 percent believe that better access to HPC can increase oil and gas production.

After deploying Windows-based HPC server technology on 1,184 compute nodes, the National Center for Supercomputing Applications saw a 7.8 percent efficiency improvement over the same hardware running Linux. The 9,472-core Windows cluster ranks 23rd on the list of the world’s top 500 HPC supercomputer rankings. The NCSA facility is one of the most recognized supercomputing facilities in the world and has deployed the largest Windows cluster to date.

One company utilizing the power of Windows-based HPC servers is Netherlands-based JOA Oil & Gas. The company’s integrated workflow software tool is designed for tight integration of geological modeling and reservoir simulation for independent oil and gas companies. Complex fields and hydrocarbons require integrated asset team decision making. The HPC version of the software provides an HPC scenario manager capable of running multiple geologic realizations on both flow and stress simulation. The proprietary matrix-free software enables asset teams to utilize a desk-side cluster in the same way they operate their Windows-based PC and handheld devices, making parallel problem solving the next step in better field development planning and economical analyses.

With larger independent oil and gas companies adopting HPC, independents are selecting this type of integrated software application because of the ease of use when running reservoir simulations without extensive training on 64-bit Windows machines. Operators can even run updates to reservoir simulation models on a laptop on the drilling rig as new data are acquired to optimize well placement.

In addition to producing, refining and distributing petroleum, gas, and derivative products, Petroleo Brasileiro SA also runs a research center (CENPES) where scientists use HPC technology to support oil-related research and development projects. In late 2005, CENPES was concerned about the time and effort required



for its research staff to manage the 500 server computers included in its HPC systems. In response, the center deployed Windows-based HPC technology on 180 of its servers. These servers now can be reconfigured in minutes instead of hours, significantly improving researchers' productivity. Researchers are able to set up HPC jobs much faster and more jobs are completed, significantly improving the productivity of both researchers and the center as a whole.

The real power of Windows is in the pervasiveness of the technology, the familiarity and ease of use, the interoper-

ability among all components of the platform, and its scalability to handle even the toughest computing challenges. With the incessant drive toward higher productivity, oil and gas companies today are seeing the opportunity to take advantage of this integrated IT platform to bring added productivity to their workforces by accurately and effectively managing knowledge across an entire enterprise. In essence, the technology is helping create an oil and gas industry knowledge environment that is truly a world without walls. □



**CRAIG  
HODGES**

*Craig Hodges leads the sales, marketing, partner and solutions teams as director for Microsoft's oil and gas industry division. He is responsible for developing and executing Microsoft's industry strategy, solutions portfolio, go-to-market model, and relationships with key industry solutions partners and customers. Hodges has more than 27 years of executive leadership experience, with the majority of that time focused on the global oil and gas industry.*

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