

# Publications

## **From Information to Competitive Advantage using Internet Technology**

**By James Pritchett**

Advanced information technology is driving improvements in productivity during a resurgence in the energy business. Feeding this technology is an abundance of seismic and well information, much of which is hard to find, stored in incompatible formats, or distributed among a variety of sources. Better and quicker decisions can be made, resulting in increased profits, when exploration companies can efficiently utilize and manage their data assets. The ultimate goals are to access available data from the latest PCs and workstations, manage the data, and easily re-access the information on a worldwide basis.

A well information management system, using the latest technology combined with a practical operational model, can effect productivity improvements offered by technology. Such a system allows companies to create private, in-house indefensibility, or intranets, to utilize and manage their data assets. E & P companies can now reduce costs historically required for expensive data centers and complex telecommunications systems by using flexible corporate data tools to integrate the company's work processes with technology. The result is the ability to manage vast amounts of well data in an organized, usable and accessible manner.

### **Overview**

Information and data related to existing wells is one of the most critical resources in the exploration process. Yet accessing and managing these data assets is a bottleneck to optimum progress in the exploration work workflow. Because of the need to analyze vast amounts of well data, projects of a few years ago costing a few hundred thousand dollars have become multi-year, multi-million dollar total field efforts. The accuracy, cycle time and costs of this expanded exploration process can be reduced with better access and management of well information.

The amount of well data to be accessed is substantial. Since the 1930's, there have been approximately 3.5 million wells drilled worldwide, 2.5 million in the United States. Most wells have several well logs with multiple curves, their own production history, scout tickets, unique core samples and often serve as a control point for a larger seismic project. Taken together, each well has megabytes of relevant data and important raw images. It is significant that the great majority of these wells do not have digitized well logs! In fact, there are approximately 150 billion curve feet of undigitized well logs (based on average well depths of 10,000 feet and six log curves per well) in the United States alone. At current rates, it could take more than 60 years to digitize these historical paper logs.

Looking at the myriad sources of well log data, millions of paper well logs are maintained in log libraries and energy companies. In addition, production and location information is maintained by governmental agencies and commercial third party vendors maintain production and location information. Interpretive information on well formation tops is also produced by third party vendors. In addition to the external data sources, most E & P companies collect and maintain information from their operations. The data is available yet is not always manageable.

As a result, explorationists can spend a great deal of time searching for and managing all of the various types of well information, instead of analyzing the data. Effectively accessing and managing this growing bank of well information has a direct impact on reducing finding costs.

### **The Goals of IT**

The E & P business is clear about what it wants from Information Technology: cheaper, faster, and more profitable activities resulting from better access to its information and good, secure links between its various offices and with others in the industry. E & P companies want their hardware, software, and data all working together more effectively inside each of the company's locations and over the sometimes great distances between them. With recent developments in wide-area networks, the Internet, increased bandwidth, E & P companies are focusing on archiving and sharing data to improve the productivity of their professional staff. This effort translates into better efficiency and increased profitability.

### **Access via the Internet**

Information technology has continued to evolve into a source of strategic advantage. The Internet has been a major tool in expediting the access and usage of this technology as a global medium for communications, content, and online commerce. Because of the ability to reach and serve a large group electronically from a central location, and the potential for personalized, low-cost interaction, E&P companies can generate tremendous bottom-line business benefits.

The costs of managing and maintaining a significant distribution infrastructure have been significantly reduced with the advent of the worldwide web. Web browsers, search engines, metadata, object oriented databases, communication linkages and languages like Java are enabling software developers to create new, platform-independent applications offering a much greater degree of data integration and access. This means, that in most cases, all an end user needs to access a system developed for the web is most any kind of computer and a web browser, like Netscape. Energy companies are adopting these technologies as a way to facilitate the inner workings of new asset teams organized to enhance the development of their oil and gas properties.

The answer lies in "fast tracking" the E & P process, breaking down the time and cost barriers to access, managing critical well information, and leveraging resources in the industry. Through an electronic well information network delivery system, companies can access well data from a variety of sources and distribute the data within the company in several formats quickly. Such a system uses a practical approach to a complex problem. A flexible, platform-independent system requiring only a web browser as a common utility provides for access to linked data stores. Implementation times are short and multiple data types are handled (well logs, headers, tops, scout tickets, etc.) Data loading is controlled for quality assurance and to ensure accurate indexing to facilitate effective search and retrieval.

The Internet has great potential as a technology, but it is only an enabler to change. How it is implemented is more important to effecting change. The best implementation is to, first, evaluate the organization's current work flow and processes. This is accomplished by interviewing and brainstorming with the client's steering team and all key users of the data to create a process map of the current work flow. At this stage, the bottlenecks to efficiency and the gap that must be filled by the data management system is identified. A future "work process state" utilizing the new technology is designed along with an implementation plan that includes revised work processes, procedures and education.

## **The Whole Product Model Approach**

A Whole Product Model can be used to evaluate the client's needs to efficiently integrate the data needed with the work process and applications technologies (at the bottom of the model) to create an optimum data management system. The different data types (at the top) are wedges around the hub or database. A flexible "finding" engine provides a link to all of the multiple data stores. An object-oriented search engine allows the user to search vast resources of data very quickly and is web-enabled for both Internet or intranet access.

## **A More Competitive Approach to the Market**

With a major oil and gas company in Houston, Petris implemented an intranet well log archive and retrieval system to reduce costs and manpower utilization, while improving the user's productivity. Process Mapping was used to understand the client's current work flow state. A project team representing each stakeholder involved in the "well log digit life-cycle" committee of project leaders agreed on the "ASIS" process map. A sample of the typical users from the various identified processes were brought in to brainstorm on the problems with the "ASIS" process and the possible desires for a new, more effective process. Issues for improvement centered around the following themes

- central point of data load and administration
- maintenance of raw data with
- interpreted version control
- multiple media compatibility
- multiple file format reader
- key index field quality control with minimal restriction
- centralized data archive
- worldwide access to the archive
- platform and application independence
- multiple data type handling capability
- fast, simple search engine that uses searching on attributes like location, depth, operator, etc

Using the themes gathered from the brainstorming session, a "TOBE" process map was constructed.

One of the industry's new technologies, WINDS (Well Information Network Delivery System), was used as the central archiving and distribution facility. Applying web browser-based technology and a practical data model, the solution addressed most of the key themes defined by the brainstorming sessions. The operating environment was set up around a data coordinator who was assigned to be the central point of receipt for loading and quality control.

## **Conclusion**

The result of using new technologies correlated with other existing technologies and raw information has been to reduce risks, costs, and the discovery-to-production lead times. This has allowed high-cost areas of production to compete for investment in a low-price environment.

Data management, the access to data and an organization's ability to use it have become critical factors in effective prospect development in energy exploration. Systems that use new Internet technology have lowered the barriers to managed well information. They can be implemented quickly and in conjunction with work process improvements.

Approaching the issue of data access and management with a thorough plan and

a strategic view to technology integration in the work process can enhance productivity, lower operating costs and improve data interpretation and analysis. Or, more succinctly, companies will make more money.

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