

## Web Enabled Software for Energy Industry Data Management

### Karl Sakocius

It was six men of Indostan  
To learning much inclined,  
Who went to see the Elephant  
(Though all of them were blind)  
That each by observation  
Might satisfy his mind.

The First approached the Elephant,  
And happening to fall  
Against his broad and sturdy side,  
At once began to bawl:  
"God bless me! but the Elephant  
Is very like a wall!" . . .

From *The Blind Men and The Elephant*  
A Hindu fable by John Godfrey Saxe

## Introduction

While divisions in a corporation are accepted as an efficient way of structuring an organization, modern corporations often have barriers between divisions, limiting their ability to interact. The result is much like the fable of the blind men and the elephant. Different departments focus on one specific area of the business while losing the vision of the big picture (the elephant). These divisions manifest themselves in different operating procedures, different software applications, and different databases.

Unfortunately, when it is time for different areas of the company to pool their resources and work together, it is difficult to manage the dissimilar data sources and applications. Moreover, when someone in the organization needs to see a detailed area of the business, it requires the use of different unfamiliar applications and databases. These "blind men" need a specific application that addresses the area of the business unit that is important to their task.

This paper describes some the issues relating to disparate databases and applications that are used throughout the energy industry and describes a solution to solve those issues. Technology standards, such as Windows NT, ActiveX, and COM, can be used to combine the data and applications from presently unrelated areas of the business into specific, meaningful information that speeds the decision-making process toward more accurate decisions. This can all be done without the effort of creating new and complex databases that require new data models, extensive setup, configuration, and maintenance.

# Background

## ***Trends in Oil and Gas Industry***

The most visionary companies in the oil and gas industry have already created sophisticated 3D geological mapping systems, integrated reservoir simulation, and advanced forecasting methods. They are now looking toward the next competitive business advantage, the technological advantage that comes from integrating a single process to integrating the entire organization.

The petroleum industry has been using information technology to intertwine specific processes of the company. However, often the methodology involves merely automating current methods. In Bill Gates book *Business at the Speed of Light* he says, "The successful companies of the next decade will be the ones that use digital tools to reinvent the way they work." Successful companies are searching for methods that accomplish goals in new, innovative, and more efficient ways. Looking for technology that strategically improves the way a company does business is an unending task, but when it is discovered or developed, it can provide a strategic advantage over the competition.

Three of the most important information technologies that enable integration are desktop systems powerful enough to handle complex technical analysis; client/server computing for access to shared resources; and distributed databases. These enabling technologies no longer come from niche players, as they did a few years ago. Now large horizontal market suppliers such as Silicon Graphics, Sun, IBM, Oracle, and many others develop them. Consequently, price per performance ratios of computing technologies are constantly improving.

Technology has been used in the quest to make decisions faster and better. No longer is it acceptable to have departments working in complete oblivion from each other. Companies have discovered that the collaboration of project workers from different departments needs to take place in the infancy of the project rather than only at the conclusion.

Every phase in the typical life cycle of an oil field requires various E&P professionals to flexibly integrate field operations data (data acquisition, drilling, enhanced recovery) with "knowledge work" (data processing, analysis, interpretation). Quality and productivity improve in each phase where people collaborate and have easy access to all the information they need. Ultimately, integration across all phases of the life cycle will yield even greater gains than integration within any particular phase.

## **Asset Team Formation**

With the goal of creating an environment where technical analysis and shared resources are used, the Asset Team was created. Asset Teams are members of

different departments working together on a focused project or projects. The integration of the ideas of the group is paramount to a successful project completion.

Asset Teams connect different peoples' perspectives, expertise, and ideas to make better business decisions in less time. Rather than following the historical hierarchical organizational structure, modern companies have moved toward the formation of Asset Teams. The members of the team will have a common goal although their expertise comes from different parts of the company (i.e. drilling, enhanced recovery, artificial lift, data management, data analysis, etc.).

The Asset Teams need more than a clearinghouse of data from all the different areas represented on the team. While it is helpful to have a multitude of data available, combining the data into a giant database strips the data of its data knowledge, creates logical difficulties in navigating this large database, and violates another trend which is the transition at the desktop.

### **Technology Transition at the Desktop**

If you look at the marketing material for a software product, it is bound to say that it is powerful and easy-to-use. That phrase represents the trend that users are seeing in software for the desktop. The easy-to-use statement has evolved from the arrival of the Windows interface and the use of the mouse. The power of desktop computers has been increasing exponentially since their inception in the 1970s with an explosion of power due to the proliferation of client-server technology in the early 1990s and the internet popularity of the present.

By bringing a high level of ease-of-use and power to the desk top, developers have promoted the feeling in the users that any data can be accessed and any information can be analyzed. In addition, it can be done easily with a graphical interface.

Typically, the solution for a user at the desktop is a large database with data from many different areas fed into it. However, by placing all data into one database, the user now must spend excess time filtering out the data that is not pertinent to the matter at hand. This slows the decision-making process. In addition, the data in an application is handled in a certain way by the application to ensure that it is useful for the purpose of the application. When the data is extracted from the application into a common database, the application logic for that data is lost and the user no longer is able to get the same benefit from that data.

### **Acquisition and Divestiture**

During 1998 and 1999 the oil industry went through tumultuous times. The price of oil hit a twenty-year low (adjusted for inflation), and energy companies were merging at an incredible pace. The acquisitions present a new host of problems for the acquiring companies. One of the major hurdles to overcome after an acquisition is the integration of the information systems. The system integration occurs at several levels including the corporate finances, general operations, geological data, exploration information, reservoir and field optimization, and artificial lift systems. It is possible that the two merging companies operate with entirely different systems for each area. In order to adequately and efficiently use the systems while the

infusion of the information and procedures takes place, the company needs tools that will allow the users to analyze and compare information from more than one software system at a time.

### **Value of Time**

As with any business, time is money, but in the energy industry, getting the product to market in a timely manner can be the difference between profit and loss. The time that it takes to get the oil and gas out of the ground directly affects the time to market for that commodity. Measures to assure that the oil and gas are flowing optimally have taken on an increased importance during the lean times in the industry. Reservoir management, horizontal drilling, improved recovery methods, and advanced artificial lift techniques are all ways that modern companies have used to optimize the time in getting the oil and gas out of the well to the market. Incorporating the information from these different applications into a single-decision support solution provides a company with unprecedented analysis for overall management of the company.

## ***Trends in Information Technology***

### **Decentralized Decision Making**

More often than not, the leaders of an organization have decided that the users of new technology should have a major impact in choosing the system. This ensures buy-in at the user level and provides insight to the decision-making process that ensures the goals of the system will be reached.

By decentralizing the decision making process, the company generally gets an optimal solution for the different areas. Unfortunately, it also gets a completely heterogeneous corporate information technology system. Different database systems, different applications, and different platforms are used across the company without a way to incorporate the information into a single analysis solution. Companies need a way to bring this information from different systems together for comparisons.

### **Internet**

The Internet has increased the ease with which information can be passed from one geographic area to another. Emailing information is as common as telephone calls were just a few decades ago. However, the technology has advanced far from merely moving data across the Internet to the possibility of actually being able to run applications across the Internet. The advantage of using the rare expert on a particular subject is now possible in many remote locations because the expert is able to access real-time data with real-time applications to evaluate and analyze situations in many different parts of the world without the drudgery of traveling there each time the expertise is needed.

## Trends in Data Management Solutions

Companies need solutions that meet today's requirements and are inline with industry trends. The components that encompass today's data management solutions span several different application domains. As shown in Figure 1, a typical oil and gas company is made up of distinctive divisions and departments.

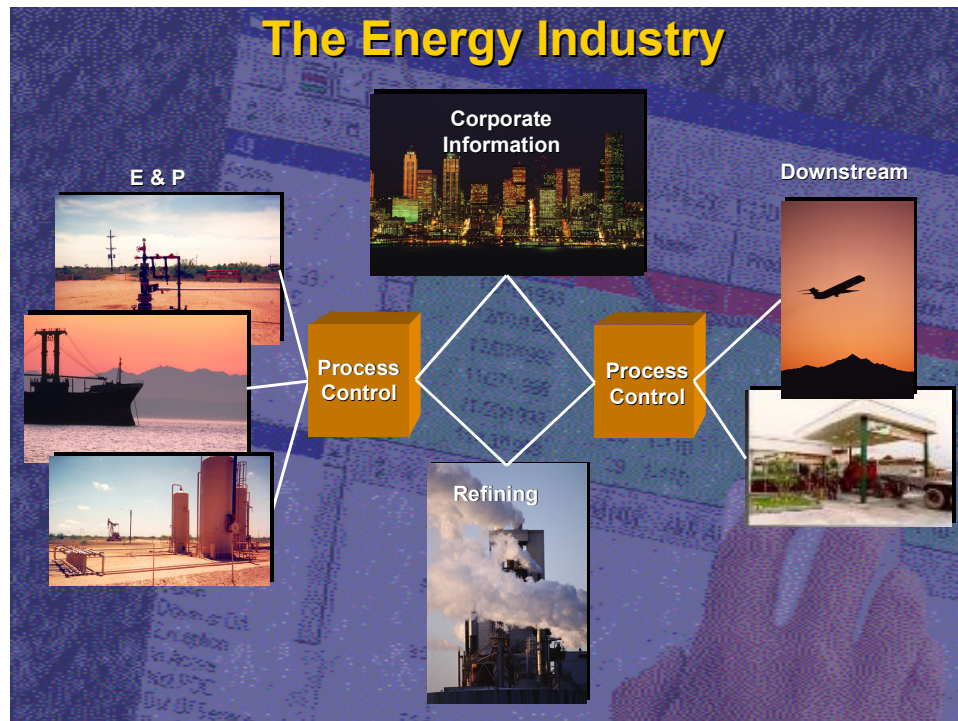


Figure 1

### Financial

Companies are ever increasing their reliance on highly technical solutions to manage the finances. The amount of data that is entered and used in a companies accounting system requires vast numbers of employees to enter, analyze, and maintain the system. Large accounting systems generally cost millions of dollars to implement and it usually takes years until the system is fully functional.

### Geology and Geophysics Application

Applications for more accurate drilling and better exploration have proliferated for the last decade. Industry trade shows are full of seismic, modeling, and mapping software that increased the likelihood of a return on drilling a well. The data collected to make the decisions for where to drill and whether to drill is valuable to other areas of the business. Once wells are drilled, the data that was collected during the exploration phase can be used for reservoir and production management. Unfortunately, the applications that contain that data are generally not suited for reservoir or production analysis.

## **Company Store**

Throughout the organization, there are pockets of information. Fields have local databases for storing information on general operations such as well treatments, pump data, and inventories. While these databases are generally created on an ad-hoc basis, the information can often be used in analysis that is more general in nature. Unfortunately, it is difficult to access that data and even more difficult to assimilate with other company information. Ultimately, the valuable information is usually beneficial for only a small task rather than available as a company-wide resource.

## **Production**

Production data is the basis of the core revenue of an oil and gas company. Many times this data is extracted by a variety of solutions. Using one tool for real-time system and one for manual-entry systems is an example of how seemingly identical information about different wells and production facilities can ultimately end up in entirely different databases. It is not uncommon for a single field to have different manual entry systems, and different real-time systems being used as a result of field acquisitions with different systems and various levels of production from different wells requiring different levels of production monitoring.

Many times the data from several different systems are combined into a single database for analysis and decision support. Unfortunately, these systems usually result in a large database with a subset of data from multiple applications and no application logic to analyze the data properly.

## **Real-time Systems**

Real-time systems allow the operators of production oil and gas fields to gain a near instant status of the wells, facility, and the entire field. There are different ways to create a real-time system, and each has its advantages.

### **SCADA Systems**

The basic task of getting status about the performance of the wells and facilities are handled by basic SCADA systems. The SCADA systems are typically created with off-the-shelf tools that allow an integrator or internal IT department the ability to custom make a SCADA system. These systems generally are limited in capabilities and very difficult to upgrade and maintain.

### **Production Automation Systems**

Production automation systems go beyond a SCADA system in that they provide not just status from the field but also the ability to analyze the results of the history and current conditions of the wells and the facilities. The production automation system incorporates engineering logic and analytical tools and formulas that allow the operator to not only identify the current conditions of the field but also predict the future conditions through trending and analytical calculations.

### **Pipeline Monitoring**

Monitoring the operations of a pipeline presents specific obstacles for a real-time system. The amount of area that a pipeline covers inherently causes communication difficulties. Internet technology can solve the geographic problems if the software supports web technology.

Numerous substations and compressors must be monitored on a regular basis. Using a typical SCADA for this monitoring can be excessively laborious considering the vast numbers of points that must be configured into the system. A system that compresses the process of configuration into a simplified solution proves its value in both the initial configuration and the on-going maintenance.

## **Engineering Applications**

### **Reservoir Monitoring**

Reservoir modeling has become prolific in the oil and gas industry. This valuable technology requires an enormous amount of data to be beneficial. That data can be used with many other applications. Unfortunately, it is rarely used in other applications because the company does not have an easy way to access and merge that data with other applications.

### **MS BackOffice Based Applications**

Many sites develop their own individual applications and databases that serve their individual needs. These applications can be used on a more general scale if the data was available to the rest of the company.

### **SQL RDBMS Based Applications**

On a larger but local scale, relational database applications are used for specific needs. Since these applications are built locally, they consequently have a unique data structure or model. Without a solution that can extract and present data adequately from different heterogeneous databases and applications, the data model makes the valuable data stored inside virtually useless to the rest of the company.

# Identifying a Solution

## ***Components of the Right Solution***

It is obvious that in today's environment, energy industry companies must create ways to combine data and more importantly, information from a variety of sources. Several methods are available for companies to explore.

The right solution has the right mix of user benefits and IT benefits. The solution must address data access and application access to be beneficial for a total solution. The right solution will include the following benefits:

- Make more proactive efficient decisions.
- Allow allocation of assets to the most advantageous areas of the company.
- Allow the flexibility to scale up efficiently.
- Lower the ownership costs of access and analysis systems.
- Increase the flow of useful information throughout departments.
- Increase the flow of useful information across different departments.
- Increase awareness of costs associated with operations across the entire enterprise.

## **User Benefits**

### **Mix of Data and Application Access**

The right solution focuses on data access and application access on an as needed basis. When requirements are for data only, data access is provided. When requirements are for application access, application access is provided. The user can be provided with only the data they need without having to wade through unneeded application features and unneeded data.

The data can be preconfigured so that the user does not need to manipulate queries. The SQL can be written by the IS personnel and the user merely chooses the data needed at the time based on layman's language.

Having the ability to create portions of applications or applets further customizes the right solution. Applets can be written and embedded into the solution so that they are a seamless part of an overall system that presents data and applications from various databases and applications.

### **Ease of Navigation**

The solution must be able to browse through large amounts of data in a quick fashion. Since the data can come from several different places around the world, hitting the database each time data is queried would be grossly inefficient. In order to make data access efficient during repeated hits to the database, the solution can provide a caching system that stores the last data queried on the local machine. This shields the database and reduces network traffic. The

cache must be configurable by the user and the user must be able to refresh it and access the database directly when current data is needed immediately.

### **Ease of Use**

As in all modern software solutions, the solution must be easy to use. A standard Windows interface with an assortment of menus, icons, and tabs that facilitate easy learning and intuitive processes provide an interface that requires minimal training and efficient work flows.

### **Configurable to Meet the Needs of Each Individual User**

Since the solution deals with a wide variety of data and applications, it is imperative that a customization facility is available. Preset views into different applications and database facilitate the usability of the application. When a user merely needs to click on an icon or tab and get the information needed from different sources, the solution is accurately filling the need of the user.

### **Integration with Microsoft Office**

Since Microsoft Office has become the standard for most of the desktops in today's companies, it is necessary that the solution interface with the Office tool set. The solution should be able to export data easily onto Excel and Word. For web applications, the solution should run in Internet Explorer.

### **Insulate Users from Complexities of Data Model and Schema**

For the solution to be used on a regular basis, the user must be shielded from the complexities of the data models and the applications. Creating objects that are based on SQL statements can solve this problem. These objects can be created beforehand and stored in a library so the users merely need to choose the data they need to see from a descriptive list. The library can be presented as an interactive browser so the users merely point and click the information needed at a particular time. As the user needs more or different data, IS personnel can create new objects.

## **IT Benefits**

The right solution will provide a decrease in the support costs of multiple applications for single users; an increase in personal productivity because users can access data easier from around the enterprise; and the elimination of inefficient practices of manually transferring data from distant to local tools.

### **Rapid Deployment**

IT needs a solution that can easily be deployed across the enterprise. Using a web architecture allows the IT department to quickly and easily create and maintain a system that can be used by anyone in the organization. The Internet or an Intranet system provides the foundation for deployment of the system and communication of information throughout the enterprise.

## **Easy Customization and Rapid Integration**

The solution should allow IT to easily customize it and integrate it with the other databases and applications currently being used in the corporation. A configurator to configure grids and trends provide IT with an orderly way of customizing the interface making it comfortable for the end user.

By using ActiveX and COM technology, IT can create ActiveX controls or applets that can use portions of applications in the solutions interface or imbed the applet into another ActiveX-ready application. This allows IT to provide the users with not only the data from other applications that are beneficial to them but it also provides the user with the application knowledge. The application knowledge is provided so the user gains the entirety of the information, but the user does not need to take the time to learn the entire application.

## **What are ActiveX and COM?**

*Whatis.com* defines ActiveX and COM as: ActiveX is the name Microsoft has given to a set of "strategic" object-oriented program technologies and tools. The main technology is the Component Object Model (COM). Used in a network with a directory and additional support, COM becomes the Distributed Component Object Model (DCOM). The main thing that you create when writing a program to run in the ActiveX environment is a component, a self-sufficient program that can be run anywhere in your ActiveX network (currently a network consisting of Windows and Macintosh systems). This component is known as an ActiveX control. ActiveX is Microsoft's answer to the Java technology from Sun Microsystems. An ActiveX control is roughly equivalent to a Java applet.

COM (Component Object Model) is Microsoft's framework for developing and supporting program component objects. It is aimed at providing similar capabilities to those defined in CORBA (Common Object Request Broker Architecture), a framework for the interoperation of distributed objects in a network that is supported by other major companies in the computer industry. Whereas Microsoft's OLE provides services for the compound document that users see on their display, COM provides the underlying services of interface negotiation, life cycle management (determining when an object can be removed from a system), licensing, and event services (putting one object into service as the result of an event that has happened to another object).

## **Right Technology**

Without the right technological structure to deliver the right solution, the effort is useless. One of the basic principles that must be followed is the ability to manage different parts of the application efficiently. Client/Server technology provides the ability to separate the application so that control of the hardware and network resources is minimized.

An example of this is a "server-centric" solution where the major portion of an application sits on the server. When the user starts the application from the desktop, the major part of the application is loaded on the client machine. In this

example, IT is able to simplify maintenance by centralizing the base of the system on a server rather than on each user's machine.

The client-server approach also provides more efficient usage of the user's machine. Instead of taking up a large amount of disk space on each machine, the bulk of the application stays on the server's hard drive. In addition, the application processing can be spread out between the server and the client machine. This leads to a more economical system because the caliber of the machines can be reduced.

### **Standards Based**

Using standards such as COM, ActiveX, HTTP, and OPC ensure that the solution is compatible with other applications. This allows applications to be integrated to create customized applications with a minimal effort from IT. By using all these standards, the solution becomes a centerpiece for creating custom, user-specific applications that require a small development and maintenance from IT.

# The Right Mix

The solution provides the right mix of IT and data management for the right solution. It uses standards that allow IT to create applets that can be interfaced into the solution or other applications. It is able to provide access throughout the organization because it is a web-based application. The customizable and friendly interface makes it a solution that can be used by even a very novice user, but the robustness of the application provides the advanced user with only the information needed with advanced analytical capabilities.

## ***What is the solution?***

Case Services' solution is a standards based application that solves the problem of sharing data and information across different applications.

The solution provides an easy way for anyone in the organization to access production data directly from the field. The integrity of the data can be secured by using the solution in its default, read-only status.

Figure 2 displays the areas that Web-based solution can access. Not only can it pull selected data from SQL-based databases, but it can also pull current data from real-time systems. Joining that with web site access creates a solution that provides a true enterprise-wide information system.

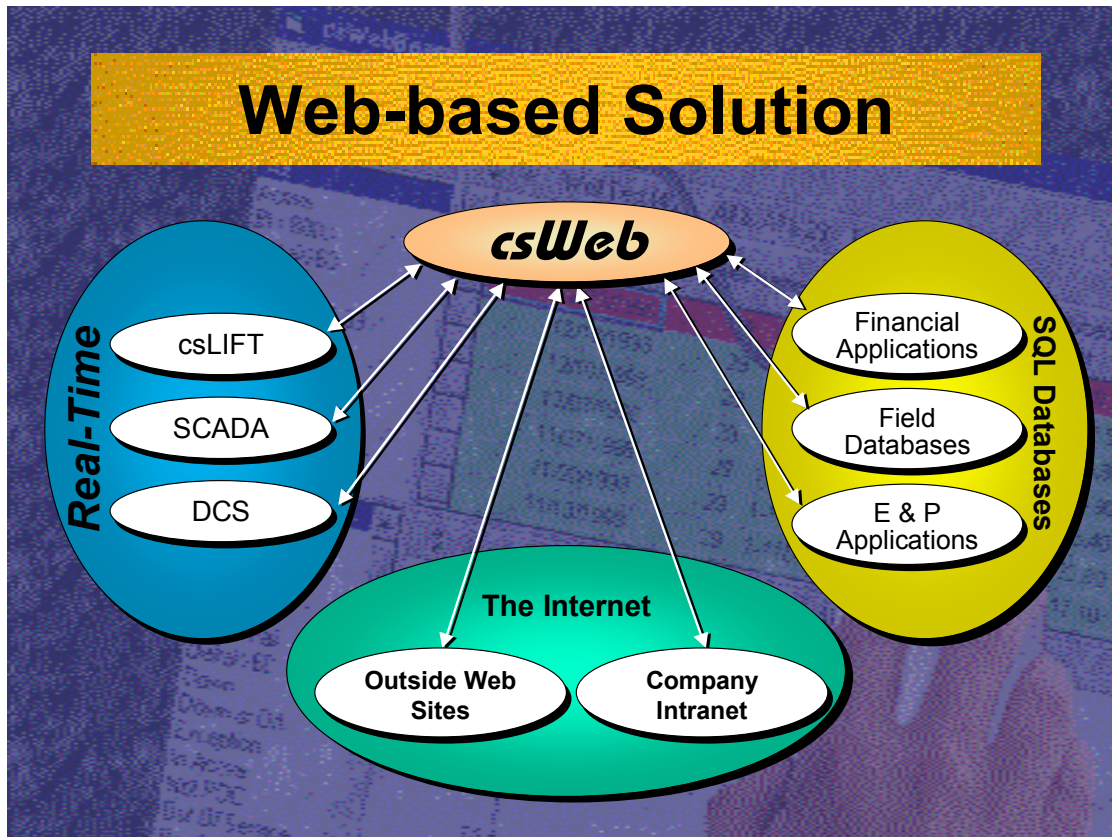


Figure 2

The ability to see data simultaneously from several databases is a powerful tool, but where the solution shines is in its ability to show data from different databases about the same subject. With the navigator, the user can scroll various items and each database will show the data related to that item. Figure 3 illustrates an example of this. The user can scroll through the wells from a field database, and the well service and accounting databases instantaneously display the information about each well.

### Web Architecture

By using a web architecture, anyone in the organization can easily access any information from any location. A field operator can access the financial data about a well as easily as a corporate director can access the recent, up-to-date information about a well in the field. A web server at a location means that location's information can be access from other parts of the company through the company's Intranet. With all offices and fields connected, a company can have total access of all information needed. Figure 3 presents the architectural design across multiple areas of the company. The open access of the solution provides the vehicle for information availability without the time and effort required to move the data.

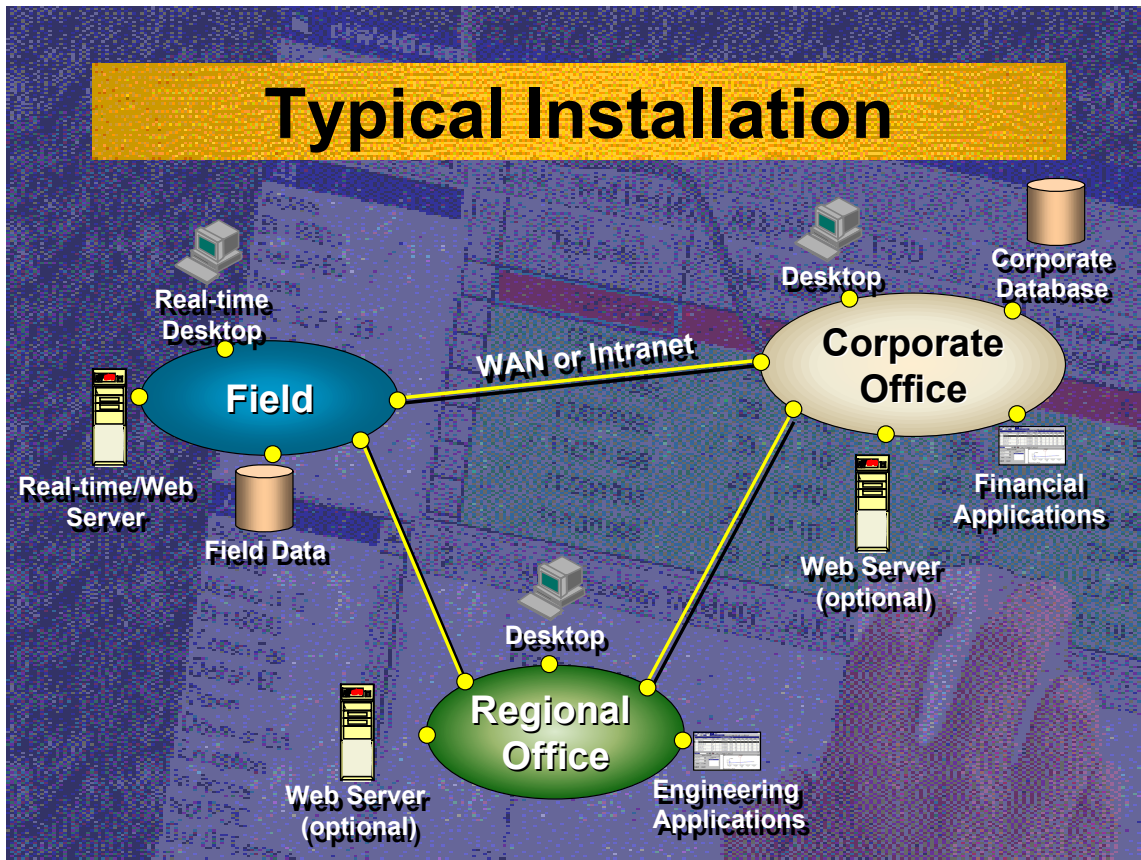


Figure 3

## System Features

### Security

The system includes a security system so that access to sensitive data can be restricted. The system honors the databases built-in security so the user must log in with an approved name and password. The applications are available as ActiveX components so only appropriate areas of the applications will be available to each user.

### Accessing Data from Other Applications

By using state-of-art technology, Case Services' solution provides the unique ability to navigate the data through several databases at the same time while using the same data item for filtering each database.

In addition, small applications or ActiveX components may be integrated into the system. These applications can extend the system to be customized to any tasks that may be needed. Programmers can incorporate any type of application even those that read and write to the database. The applications can be tied to the navigation system of the system so it can respond to the text or map navigators. Figure 4 displays a small application in one quadrant of the screen.

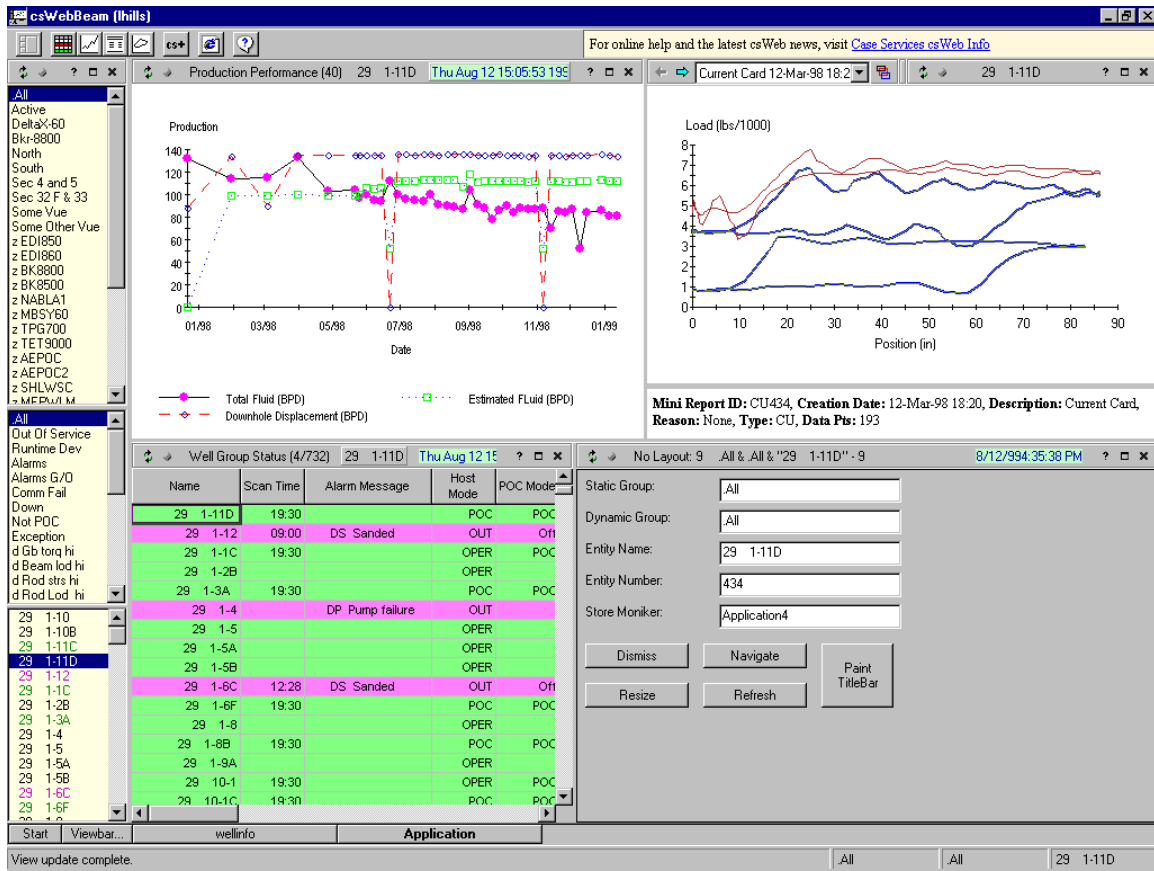


Figure 4

### GIS Based Navigation

The navigation section of the interface can be either text or graphical. This gives the option of using an interactive geographical representation of the world where the user can point to the area from which they need information. The user can “drill down” from the world map to a continent and so on to a particular well if needed. Figure 5 shows both the text navigator on the left side of the screen and the geographic navigator in the upper-left quadrant of the work area.

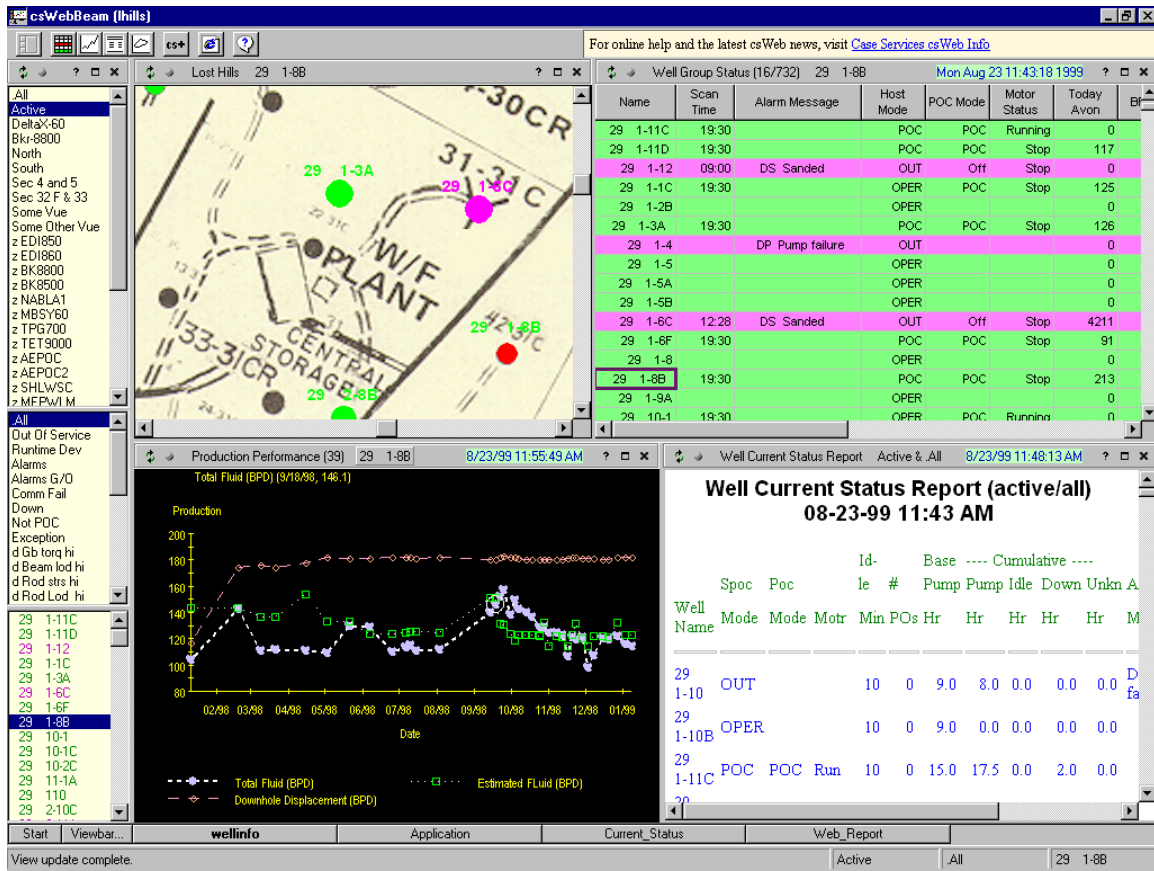


Figure 5

### Ad Hoc Browsing, Exports and Reports

A user can use the browser to search through the specific information that is needed at a particular time. With a few clicks of the mouse, the user has control of what data is presented on the screen and has the ability to display four different data sources simultaneously. This gives the ability to scroll through a list of data such as a list of wells while the data displayed is immediately updated.

Once the user has the information needed, that information can be easily exported to any SQL-based database or Microsoft Office product. Collecting the right information and using it in the user's choice is a few-click process.

Of course, if the user needs an executive-style report, the solution's report feature provides the solution. HTML reports can be created based on the navigated information. Figure 5 displays an HTML report in the lower-right quadrant.

### Customizable by Customer

When using the solution, the user can choose different data sources to compare and analyze data from the field. When the user finds a particular look that he/she will use on future occasions, he/she can save it as a new view. That view becomes part of the interface that the user can call up by merely clicking on a tab on the lower part of the screen. The user can create as many views as needed. Figure 8 displays the easy-to-use window for adding a new view to the interface.

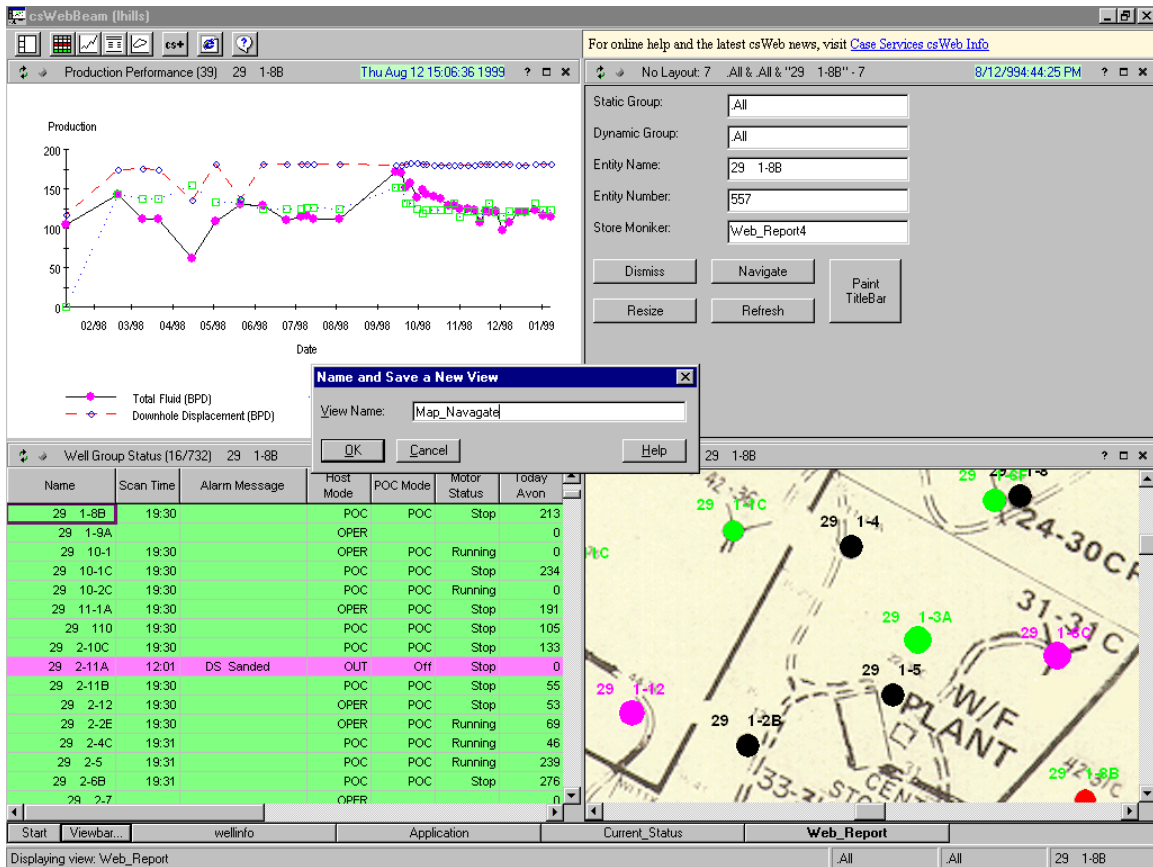


Figure 6

The screen can be divided into as many as four separate screens. Each of the screens can access different databases, real-time data, or web sites. In addition to the four screens, the navigator section is available to move from one subject (well, facility, field, etc.) to another. In addition, the user can use the mapping interface to navigate by clicking on the color-coded areas of the map as shown in figure 6.

### Trending Data

Users can create graphical trends of historical data by merely clicking on their choice of trend from the list created by the system manager. The trends provide a unique way of looking at the data that allows the user to predict future status of wells, spending, or trend of other data. This allows the user to predict and take proactive action to prevent problems rather than react to problems after possible

damage is done. Figure 7 displays the graphical for production amounts and run-time for producing wells.

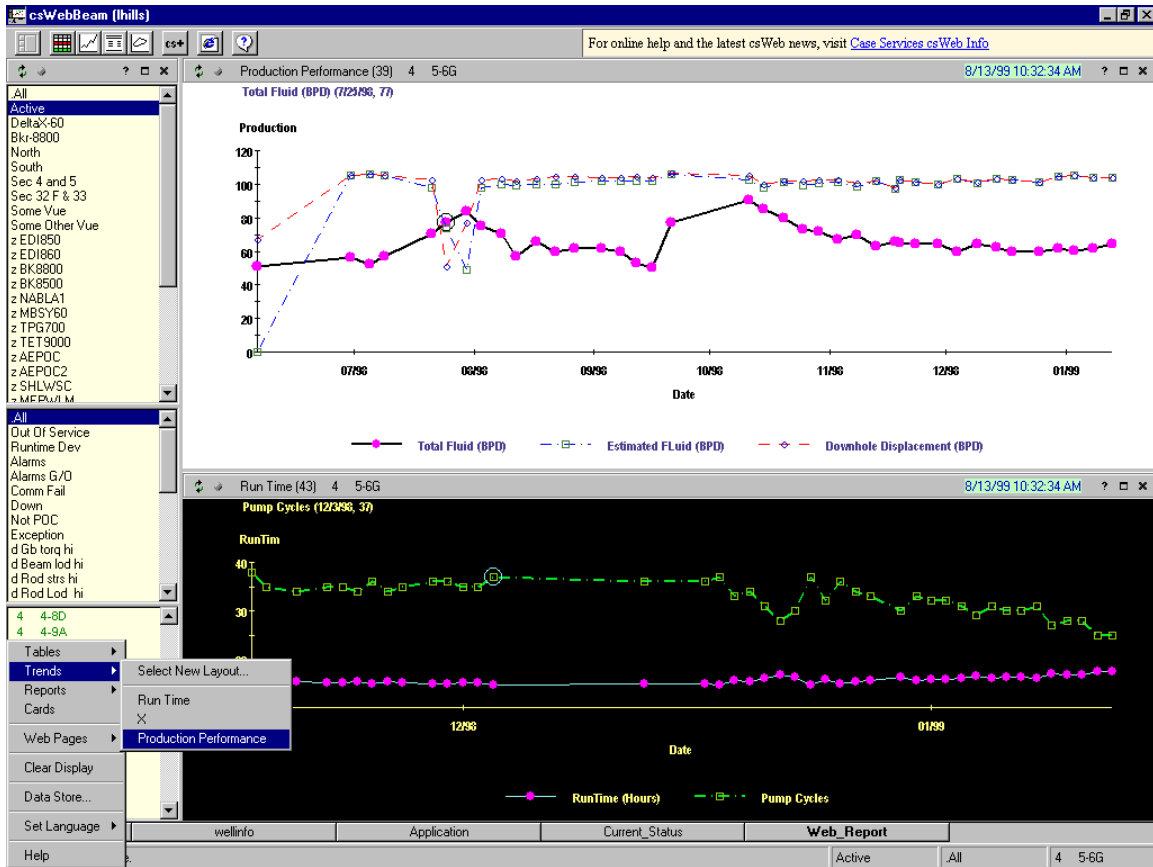


Figure 7

### Integration with Microsoft Office

The solution can run inside of Microsoft Internet Explorer. That it can easily be used as a web application. In addition, any of the information displayed can easily be exported into Excel, Word, PowerPoint, and Outlook. If a user is most comfortable with analyzing data in an Excel spreadsheet, then a few mouse clicks transfers the data into a spreadsheet ready to use.

### Benefits

#### Reduced Training Time

The solution eliminates the need to train everyone on entire applications when they only need access to a certain area of the applications. An ActiveX component can be created so that the user only needs to learn the portion needed.

#### Easy Configuration and Deployment

Since it is a web-based, client-server solution the deployment takes advantage of the latest technologies and streamlines the actual implementation.

**Solution Architected to Meet Large Variety of Needs**

While most tools meet a specific need, the solution brings all the specific-needs tool's information into one decision-making solution. By pooling all this information about a single subject together, the solution provides a solution for faster, more-informed decisions.

# Conclusion

More often than not companies attack the problem of assessing data from multiple domains by using one of two solutions – Data Migration and Application Access. Each has strengths that the other cannot accomplish.

## Data Migration

Data migration is the process of moving data from one database or application to a common database. This generally results in a data warehouse, which provides a safe database for users to access and query without affecting the integrity and the performance of the production database.

Data warehouses typically become clearinghouses for data from multiple databases and applications. The goal of the data warehouse is to create a data model that accommodates all the data that is pumped into it. The data warehouse requires a considerable amount of design and configuration initially, and requires regular maintenance throughout its existence.

## Issues with Data Migration

Several issues must be overcome to properly benefit from a data warehouse. Sadly, it is nearly impossible to migrate the entire usable database. What is generally moved into the data warehouse is a subset of the data. This subset is useful for superficial analysis, but does not provide the detailed analysis that the entire database and application knowledge provide.

In addition, there is a substantial expense involved in moving the data and setting up the database for the data warehouse. The data model development is a logical process that requires a considerable amount of time to create, test, and implement. Tools that do the initial and regular data transfer are another expense that must be incurred. Depending on the amount of the data, these tools will cost six-figure amounts.

The data warehouse database generally becomes quite large as it evolves. With the evolution of its size, there is a need to perform regular maintenance on it. Any large database can benefit from some of the hundreds of maintenance tools that exist on the market.

## What is Application Access

Another approach to providing valuable information across the enterprise is to provide each user access to each application. This allows all the data from the application to be available to all users, and merely stripping the data from the application does not lose the application knowledge.

Since the proliferation of the Internet and Wide Area Networks (WANs), the ability to access applications anywhere across the world is now possible. Client-server applications provide the amount of security needed by restricting certain users from

changing the data in the application and restricting certain parts of the applications from selected users.

### **Issues with Application Access**

Costs associated with providing access to all users will often make it prohibitive to provide the application to every user who may need access to it. Even if there is a corporate license in effect, the infrastructure required and the effort to maintain application access to a large number of users is a daunting task.

Each user of the applications must go through training in order to properly benefit from the application. Usually the 80/20 rule will be true. Approximately 80% of the users will only use 20% of each application. Since most applications are highly integrated, the users will need to be trained on a great part of the application that they will never use.

### **csWeb**

Case Services has created a tool called csWeb to address the issues raised in this paper. Rather than choosing whether to move data to a centralized database or provide application access to anyone who needs it, companies can use csWeb to bring the exact data applications needed to each person's desktop. To use the *Blind men and the Elephant* metaphor again, each person will "see" the portion of the "elephant" that is pertinent to their task without losing sight of the total "elephant."

csWeb provides access to disparate databases so that the user can compare the data for more detailed analysis. The user has the ability to see real-time information plus historical information in spreadsheet or graphical format. All this is done without a major IT initiative that creates a centralized database and without giving each member of the company access to every application used.

The solution is easily extensive so that IT can create groups of small applications that each provide insight to a specific area of the company. These applications can be combined together for individual users providing a comprehensive, custom application with minimal set up and development effort.

In today's world, efficiency in operations will come from better decisions enabled by getting the right data into the hands of the right people at the right time. csWeb is the ideal solution to make that happen. Standards based approach ensures that investments made in deploying solutions will last for years to come and be compliant with current and future needs.