



Cultivating Project Information

*Collaboration is in full bloom
at Burns & Roe with ProjectWise*

By Jim Utsler

SUMMARY

Organization

Burns & Roe

Vertical Market

Plant

Locations

Oradell, NJ

New Mexico

South Carolina

Project Objectives

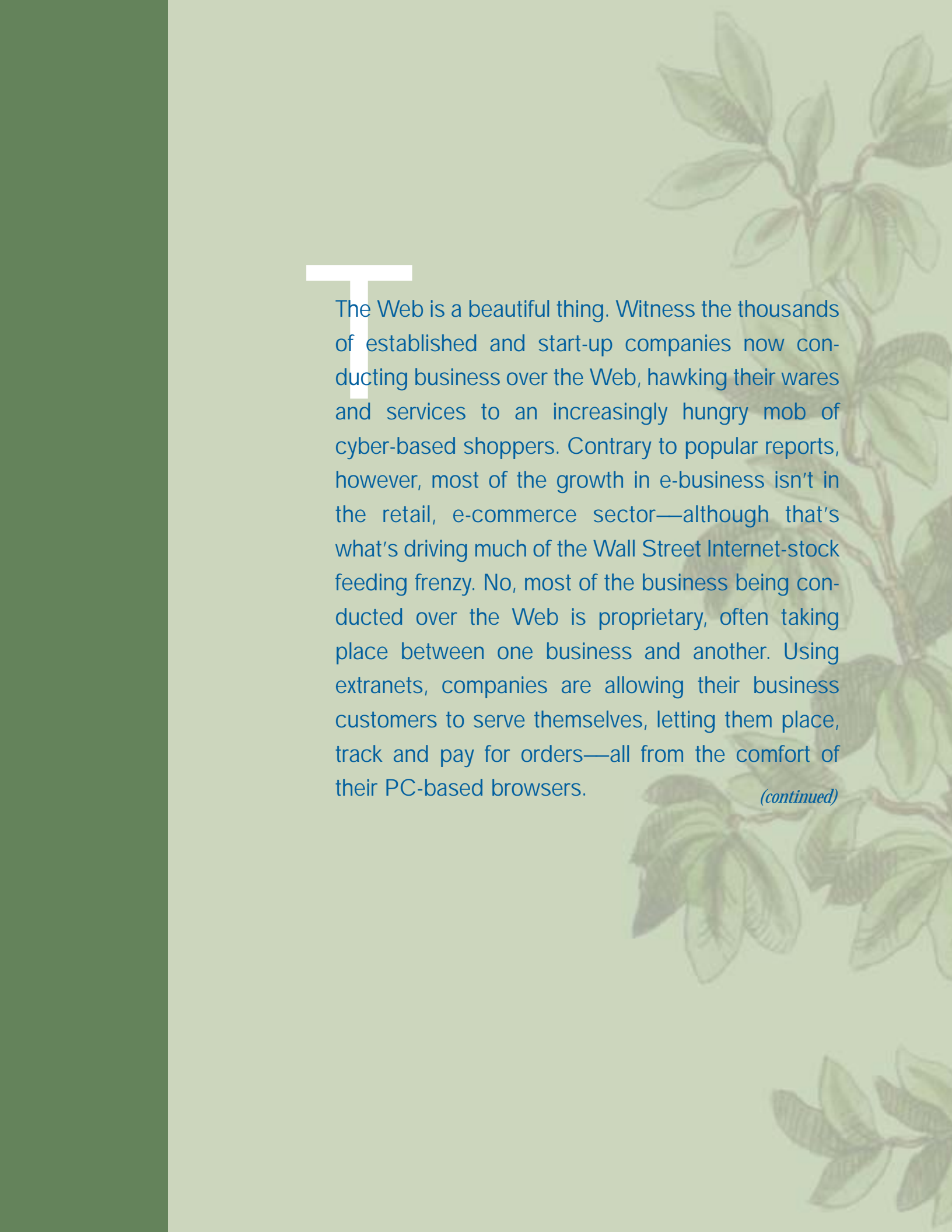
- Real-time interaction between desktop worker and the data supporting the business
- Distributed engineering
- Global collaboration

Fast Facts

- Non design departments, such as human resources, are implementing Bentley solutions
- Clients view documents and drawings seamlessly over the web
- Users have access to legacy data
- Increased collaboration with users

Bentley Products Used

- ProjectWise®
- Microstation®



The Web is a beautiful thing. Witness the thousands of established and start-up companies now conducting business over the Web, hawking their wares and services to an increasingly hungry mob of cyber-based shoppers. Contrary to popular reports, however, most of the growth in e-business isn't in the retail, e-commerce sector—although that's what's driving much of the Wall Street Internet-stock feeding frenzy. No, most of the business being conducted over the Web is proprietary, often taking place between one business and another. Using extranets, companies are allowing their business customers to serve themselves, letting them place, track and pay for orders—all from the comfort of their PC-based browsers.

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Unearthing ProjectWise

ProjectWise is a dynamic solution encompassing all of the properties necessary to achieve a rapidly deployable Engineering Information Management (EIM) intranet or extranet solution. This multi-tier client-server based application is scalable to a full enterprise EIM solution. It includes security systems that determine who can view or access information through the Internet or their own intranet.

Other engineering information management features include:

- Secure check-in/check-out
- Quick viewing and redlining (using ModelServer Publisher and MicroStation PowerScope)
- Dynamic access to information from remote sites
- Document storage, protection and retrieval
- Windows, Internet browser and Java client interfaces
- Workflow management

There are two types of ProjectWise Solutions:

- **ProjectWise Extranet**—A rapidly deployable, next-generation solution for engineering information management, real-time publishing and collaboration using the Internet and a browser client. ProjectWise operates on your LAN, WAN or extranet to provide a secure, controlled, centralized environment for engineering data and meets the needs of the engineering workgroup, as well as the entire project team.
- **ProjectWise Workgroup**—A rapidly deployable solution for project workgroups whose members are typically from one organization. ProjectWise Workgroup utilizes a Windows client to access project information and operates on your LAN or WAN, or it can use the Internet as a wide area network, via TCP/IP.

There are several advantages of ProjectWise that have contributed to its success over other project extranets, especially those that focus only on access to information. These advantages include:

- Providing informational integrity at every step of the engineering and construction process through integrated user access management, workflow management, version/revision control and information publishing.
- Integrating with key engineering, construction and office applications and incorporating their data.
- Getting project extranets operating quickly, as rapid deployment services are an integral part of ProjectWise.

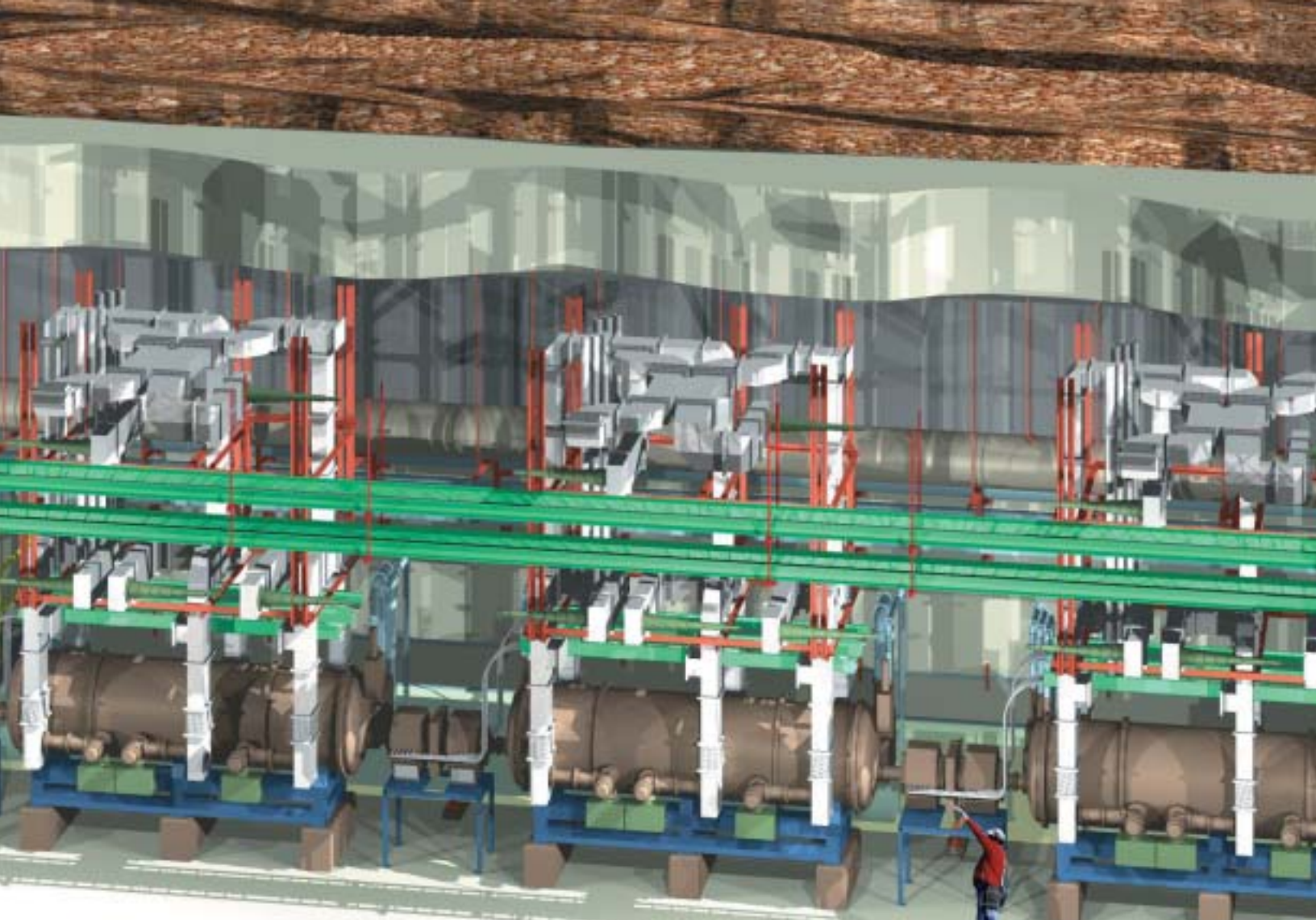
No less significant is the rising use of the Internet and other networking methods to facilitate intra-company communications. Most businesses already rely on the Internet or other networks in some fashion or another to communicate internally, usually through E-mail. But with the advent of workgroup applications such as ProjectWise, that limited-use—and nearly Stone Age, in Internet years—approach to the Internet is forever changing.

Simple E-mail is, in fact, being replaced by sophisticated give-and-take, nearly real-time interaction between the desk-top worker and the data that supports the business—no matter where either of them is located. Whether across the nation or around the world, people can now dive into and take control of the files they need, without the cumbersome and time-consuming chore of having to overnight documents or files or using the sometimes unreliable method of E-mailing attachments.

Like most other companies, engineering firms aren't immune to this paradigm shift. They and their business partners—construction contractors, for example—need quick access to their crucial files. And they can't wait for files to be delivered to their doorstep.

Burns & Roe Engineers and Constructors discovered this in 1998, when it decided there had to be a better way to connect the designers and engineers in its scattered offices to a centralized database of mission-critical, MicroStation-generated files.





Moving the work

The need for a project and document management system became clear when Burns & Roe began working on the Accelerator Production of Tritium (APT) program for the U.S. Department of Energy/Defense Programs (DOE-DP). The project, which began in September 1996 and is scheduled for completion in 2007, involves the design and construction of a new APT plant at the DOE's Savannah River Site, which encompasses 310 square miles in South Carolina. The plant is being built to produce tritium using a proton linear accelerator system. It consists of four major components:

- A linear accelerator that directs a proton beam at a tritium-producing target/blanket
- A target/blanket facility in which the tritium would be produced
- A tritium extraction facility
- The complex that houses the associated systems

No small job. And because of the nature of the project, Burns & Roe needed to use designers and engineers at three of its sites, including its headquarters in Oradell, New Jersey, and two other sites in New Mexico and South Carolina. Instead of relocating the engineers to one location, the company decided that a collaborative workgroup solution was needed.

"The APT project necessitated us to link the offices in New Jersey, South Carolina and New Mexico," says Bill DiGregorio, CAE systems supervisor with Burns & Roe. "It was imperative that we get online and share documents."

With that impetus, the company began exploring its options, looking at several different document-management applications before deciding on ProjectWise. The three primary reasons for this

decision were the product's integration with MicroStation, its Web capabilities and Burns & Roe's company-wide strategic initiative to migrate from a UNIX-based IT environment to a Windows NT environment.

Before implementing the solution, the company had been sharing the APT documents via E-mail. As one might imagine, this created a litany of associated problems, with files taking forever to download, E-mails sometimes not making it to their destinations, and multiple copies of files coming into existence. The

confidence

latter was particularly troublesome because it meant that more than one person could be working on the same file at the same time and not be aware of it. The results could be problematic, with changes being made to one copy of the file but not another.

"We had documents that were being done in New Mexico that needed backgrounds that were being completed in South Carolina, and at the time, we were using E-mail to send the documents back and forth," says DiGregorio. "Sometimes they got there, sometimes they didn't. If the reference files changed, we weren't sure if the changes were being passed along. A whole host of issues opened up."

Once the decision had been made to adopt ProjectWise, the company moved rapidly—albeit not without some growing pains—toward implementation. With the help of Bentley and The Promus Corporation, a Bedford, Massachusetts-based MVAR, the system was operational by October 1998.

The implementation involved not only kick-starting the application, but also setting up the appropriate databases for, first, the APT project and, then, other company projects. In the case of the APT project, this involved setting up file storage areas at each of the three locations working on the project. The files that were being worked on primarily at the New Mexico office, for example, would reside on that local server, with access being granted to the other offices from that location. If a file started at one location but was worked on primarily at another, the file would be moved. All of the servers, however, are administered out of the New Jersey office. The reason for the division of the servers was due to transmission times.

According to DiGregorio, "The amount of time it would take to call up a drawing locally was maybe 10 seconds, versus going from New Mexico to [New Jersey], which would take two minutes. The idea was to minimize as much network traffic as possible."

A level of confidence

Burns & Roe will be following this paradigm for all of its projects, with the major ones being given their own databases and their associated files being centralized locally. As with everything, though, this isn't done by magic. Data sources have to be created, user accounts have to be set up, users have to be matched to their internal groups, and the users have to be trained. To address the latter issue, the company has instituted two classes, one for beginners, covering issues such as logging in and creating and copying files, and the other for advanced users, addressing topics such as the bulk loading of reference files for previously existing projects.

Before implementing ProjectWise, the company had been using an internally created document-management system that ran off of a UNIX server. The importance of the training was in part

due to a mindset that had settled in at the company, which had been used to a UNIX environment.

"The users knew how to check out drawings and get reference files; they knew how backups were performed," says DiGregorio. "Now that we have a new product, there's a lower confidence level. And there's always a bit of questioning: 'Is this going to work? What if there's a problem? Is it something I did?' Getting over that was one of the big obstacles."

Now—with some of the trepidation subsiding—the users are accustomed to the new system, which is an extension of their desktop systems to which they download their files. As other companies that have taken the workgroup plunge have discovered, a product such as ProjectWise can make all the difference in collaborative workflow.

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Now that information can be sent and received using the Internet and a simple Web browser, it opens a whole new world of possibilities for project management and workgroup collaboration in a virtual environment. Project managers can secure and centralize engineering and project information for everyone who needs to see it. In this environment, teams can reduce costs and save time as they gather and disseminate information throughout the project life cycle.

Reaping the Rewards

With a central project site on the corporate Intranet, project teams have a constant window into a project's evolution and can communicate, coordinate and collaborate effectively with all the other team players, wherever they happen to be.

When determining your return on an investment in a project site and an Engineering Information Management (EIM) solution such as ProjectWise, you should factor in the following:

- **Reduced costs associated with document creation, distribution and printing.** Organizations that have implemented EIM solutions have experienced reduced costs associated with document creation and distribution. In the areas of printing and plotting, it has been estimated that 2% of total project costs are for reprographic services, such as plotting and photocopying. On a \$2 million (US) project, that's an immediate savings of nearly \$40,000. Consider that a standard D-size check plot has an average cost of \$ 3.50 per print. This figure is based on supplies and maintenance cost alone—and does not take into consideration the cost of an individual's time in creating the plot. On average, a standard project will print between 2,500 to 3,200 plots per month. Using ProjectWise as a collaborative tool, the number of check plots can be drastically reduced—in most cases, by a minimum of 50%. Take one half of the plots you do on a monthly basis and multiply that by \$ 3.50. Add that figure to the cost savings provided with the productivity increase—and your bottom line gets better. . . faster.
- **Assistance in regulatory and standards compliance.** Incorporating an EIM solution with the ability to publish and utilize current project data via a project Web site enhances an organization's ability to not only collaborate, but to comply. For organizations seeking ISO or OSHA compliance, the ability to maintain and control critical documents from a single location and to distribute them in a secure fashion has allowed organizations to realize numerous benefits, especially as it relates to gaining and maintaining compliance.

With a project Web site, regulatory and/or standards compliance is less time-consuming. The ability to distribute information quickly and accurately increases construction and plant safety. Standard procedures are immediately accessible and employees are guaranteed the most up-to-date information when they need it. With the high cost of regulatory penalties, coupled with a typical return on investment ranging between nine and 18 months, the value in an EIM solution is clear.

- **Increased productivity.** Productivity of your design team increases when they have the information they need at their fingertips. Recent studies indicate that, on average, 10% to 30% of an employee's time is spent looking for information. The ability to access critical information quickly is a hallmark of a good EIM solution.

Let's start with a basic assumption—your operational engineering staff has a burden factor of \$ 50.00 per hour. Assuming that your EIM solution provides each user with a mere fifteen minutes per day of increased productivity (an increase of only 3%), you have just lowered your production cost by \$12.50 per day per seat. If you look at a marginal 10% gain in productivity, the savings would increase to over \$35.00 per day per seat. Calculate both the 3% and 10% increase in productivity gains per seat over the life of the project and you will see how quickly an investment in a ProjectWise solution can provide a positive impact to your bottom line.

expanding

Burns & Roe designers and engineers can now access the files they need from the appropriate server, download it to their desktop, perform their magic on it and, when finished, upload it back to the server. If a file is in use by someone else, all the pertinent user information—including the date it was checked out, who has it, and where that person is located—is indicated on the screen. The user can then call that person and ask him or her the disposition of that file.

"In addition, someone can pick up the phone, call another user and ask, 'I'm issuing a drawing today and I need to see your changes. Is there anyway you could update the server copy?' The other person could say, 'Sure' and hit a command. He doesn't have to get out of the file or check it back in. All he does is hit a command, and it sends a copy back to the server so a different user can reference those changes as of that date. It's as close to live interaction as you can get," explains DiGregorio.

Additionally, ProjectWise also contains a redlining feature that allows engineers to view changes, annotate the drawing and mark any changes on the screen as they would on paper. They can then attach a redline file to the document, send it back and alert interested parties via E-mail that redline comments have been added

to the design. This is all done without the engineer having MicroStation available on his or her desktop PC.

"The redlining features mean that we have up-to-the-minute collaboration capabilities, providing a more time-efficient platform for document revisions and approvals," says Wayne Uffleman, CAE/CAD system manager at Burns & Roe. "As a result, Burns and Roe expects to greatly reduce project schedule time."

Expanding use

Burns & Roe's implementation of ProjectWise in the design and engineering aspects of the company has been so successful that other, non-design departments within the company—including human resources—are exploring its use for other nontraditional applications. This is in part due to the company's use of ProjectWise as a document manager for non-CAD related documents, including word processing and spreadsheet files.

DiGregorio is using this capability to disseminate ProjectWise documentation. This allows him to avoid having to distribute 200 or so copies of the manual to three different U.S. locations. Instead, users can go to the folder in which the file is contained, double-click on it, and view or print it.

"I only have one centralized place to update the manual, and I don't have to worry about making changes and redistributing it to 200 people," explains DiGregorio. "Because of that, some of our other groups are considering ProjectWise as a repository for their documents, such as proposals and resumes. ProjectWise is moving from almost solely a design tool to being an enterprise solution tool."

This capability is also being extended for use by clients. Using a Web browser, Burns & Roe clients will be able to view documents and drawings pertinent to their project. Unlike the Windows interface in use by internal users, however, they won't be able to make changes to the drawings. DiGregorio expects to enable this ProjectWise capability by the end of this year.

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CAE Systems Supervisor
Burns & Roe



community

He is also considering implementing the application's Java client, which is essentially a Windows client available over the Internet. Unlike the Web interface, which doesn't allow for changes to documents or drawings, the Java client is full-featured, allowing remote users—whether at home, a building site, or wherever—to update drawings via the Web, assuming they have MicroStation installed on their local PC.

"Say they're out in a trailer in the field somewhere and say, 'I want to make these changes.' They can actually go into the Java client—which is essentially ProjectWise over the Web—log into the database, double click on a document, lock it, call it up on their terminal and go to work," says DiGregorio.

Burns & Roe has also extended ProjectWise to allow users access to old project drawings. The company has scanned in stick drawings and is making them available in the ProjectWise database. This negates the need for designers and engineers to search their offices looking for stick files. As with any file available through ProjectWise, all the user has to do to access a scanned file is double-click on it to bring it up on the terminal. In the future, DiGregorio expects to do this with current projects, as well, giving clients an easy way to get a heads-up on ongoing work.

In addition to giving users access to legacy information, this auxiliary use of ProjectWise allows the company to free

up otherwise useless space occupied by physical files and documents. According to DiGregorio, "You're not only making the data accessible to everyone, but you're also getting rid of a little paper at the same time."

Community effort

What started off as a fix to a document-management issue for a single project—the APT program—has since blossomed to encompass many different aspects of Burns & Roe's operations. Not only can users gain easy access to their drawings, but they can more easily collaborate with each other, with everyone being aware of what everyone else is working on.

Committed to using ProjectWise throughout the organization, DiGregorio has teamed with other ProjectWise administrators to form a user group community devoted solely to addressing issues involving the application—the ProjectWise of the Americas Special Interest Group (PWASIG). While still in its infancy, the group is already generating interest, with its first meeting just recently held in Las Vegas (see related sidebar above).

"We wanted to establish a community where users could come in and say, 'I can't do this. I can't do that. Can you give me a little help here?'" explains DiGregorio. "It's a great place where users can go to ask relevant questions of their peers and get relevant answers."

Like so many other companies, Burns & Roe has discovered the true value of the Internet and networking in general, beyond just E-mail and high stock prices. In ProjectWise, it has found an invaluable collaborative ally.

"ProjectWise provides real-time response to critical tasks and we know we're working on the most current file," says Uffleman. "Burns & Roe can now protect its investment in the engineering data that it creates for its projects."

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