



Microsoft Customer Solution Manufacturing Industry Case Study

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Overview

Country or Region: United States

Industry: Professional services

Customer Profile

Founded in 1955, Barge Waggoner Sumner & Cannon, Inc. is a 400-person engineering, planning, and design firm with 11 offices in the southeastern United States.

Business Situation

Barge Waggoner needed to collaborate across geographically dispersed offices but faced challenges regarding document version control, information access, and lost productivity as employees moved among offices.

Solution

The firm deployed ProjectWise collaboration software and integrated it with Microsoft® Office SharePoint® Server 2007 for document and process management.

Benefits

- 25 percent more revenue per employee
- 8 project hours saved daily
- ~15 percent of project costs saved
- Reduced employee travel
- Less project rework

Design Firm Raises Per-Employee Revenue by 25 Percent with Collaboration Solution

“With ProjectWise and Office SharePoint Server, we’ve been able to increase utilization and raise the revenue per employee by approximately 25 percent.”

David Davidson, President and Chief Operating Officer, Barge Waggoner Sumner & Cannon, Inc.

Multidiscipline design and engineering firm Barge Waggoner Sumner & Cannon, Inc. needed to collaborate more efficiently across its 11 offices in the eastern United States. The firm deployed ProjectWise collaboration software for engineering content management, content publishing, and design review and integrated it with Microsoft® Office SharePoint® Server 2007, to manage business processes and additional information in its distributed environment.

Now, employees travel less thanks to improved file version control that negates the need for in-person information sharing; make better use of expertise from around the company; and find the right information quicker, regardless of its location in the corporate IT environment. The firm makes better use of its people’s time and knowledge and has increased revenue per employee by approximately 25 percent annually by raising the productivity of every person.



“The average project team is composed of 10 to 25 people. At 20 minutes saved per day per person, that’s up to 8 hours of productivity gained per day per project team.”

Joe Croser, Global Marketing Director of Platform Technology, Bentley Systems

Situation

Founded in 1955 in Nashville, Tennessee, as a civil surveying firm, Barge Waggoner Sumner & Cannon, Inc. has since expanded to 11 offices in three states. The firm offers engineering (civil, structural, environmental, transportation, aviation, mechanical, and electrical), architecture, planning, landscape architecture, and surveying services. It peaked at over 500 employees, but since 2000, it has responded to market pressure and a shrinking technical talent pool by completing more projects with fewer resources; as employees left or retired, it did not hire replacements. To support its decreased headcount of 400 people, the company made technology investments to help increase productivity. With fewer employees—but the same amount of work—the company needed to address several issues that made productive collaboration difficult.

Difficulties Sharing Files Across Offices

Architects and engineers at Barge Waggoner require a managed environment for their projects, and they also need to collaborate with colleagues and clients outside of their project teams and in other geographical regions. Teams shared files across a wide area network (WAN), but performance for file sharing was poor. As a solution, employees often copied the files that they needed and then stored them locally, which meant that edits to files had to be communicated and incorporated into the original files manually. Teams also copied computer-aided design (CAD) drawings and other project files onto CDs and mailed them between offices. This incurred postage charges and, by the time a CD arrived at its destination the data was anywhere from two to seven days out-of-date.

People often did not know if they were working with the correct and current versions of files. Changes made to files were not always completely or quickly reflected

throughout the system. Paula Harris, Corporate Marketing Director for Barge Waggoner, says, “Too often, we had version-control issues. We would waste money and effort editing or printing outdated documents—work that had to be redone once the mistake was caught.” Redoing work is very costly because the time spent comes out of the company’s profit margin—clients only pay to have the work done once. Efficient change management is also important because clients often ask for new features as projects progress, and deadlines require that collaboration happen in as close to real time as possible.

The company tried to eliminate the drawbacks of sharing files across the WAN by temporarily relocating employees to the offices where their projects were based, but often those employees were not fully utilized while they were there, and the offices that had loaned them lost 100 percent of their time during the projects. In addition, the employees who traveled lost productivity to travel time, and while waiting for IT staff to set up their computers at the new office with the right combination of software that they needed. The company uses approximately 500 applications—from a simple fan-selection program to specialized and sophisticated tools for designing heating, ventilation, and air conditioning systems and conducting structural analysis—so making sure that everyone had access to the right programs took considerable IT time and effort. This also meant that the company had to pay for more licenses for software that was sometimes used only for a few weeks.

Between the lost productivity and difficulties in sharing work, Philip Newby, Corporate Technology Director of Barge Waggoner, says, “Our process was very inefficient. It resulted in a low return on investment for software licensing and a lot of resistance to sharing work.”

Problems Finding Role-Relevant Information

Whether at their home offices or on the road, Barge Waggoner engineers, architects, designers, and project managers could not easily find and share the information that they needed. The firm estimates that, like at most engineering firms, its employees spent up to 40 percent of their engineering time searching for and validating information. This was due not only to the versioning issues, but also to the sheer volume of engineering files and the relationships among them.

A joint composition file, from which paper blueprints are printed, is a sort of master file that references dozens of architectural, structural, mechanical, and civil elements that are stored in many individual CAD files (such as model files) by specialized engineers. Thus, when an engineer or architect opens such a master file, it pulls up dozens of other files at the same time that are referenced by the master file. It is clear to the owner of a master file which model files are referenced by it, but owners of the model files at Barge Waggoner had no way to determine which master files referenced theirs. This meant that when model file owners changed their files, they had no way to alert all the colleagues with master files that referenced them, which led to more versioning issues and the need to reprint and reship drawing files when someone identified a versioning error. By the end of each project, teams also had to route all project files through managers and testers for approval as part of quality control—another slow, manual process.

Employees who wanted to find information in model files (for example, to reuse components for new projects) were not able to efficiently search for the information unless they could locate a master file that referenced what they were looking for. Many of these searches consumed valuable time without positive results. Often, engineers

would design new project components because they could not find the existing ones, which were lost in the thousands of files stored in disparate locations across the firm. This duplicated effort hurt productivity. Newby says of the company's project processes, "We realized that in order for us to be competitive, we had to utilize our people's expertise and talents more efficiently. We're asking them to do more—and to do it faster and better—so there's not a lot of time to search for project information and verify its accuracy. We work on 1,500 to 2,000 projects a year, so this is an important issue."

Solution

Barge Waggoner turned to its longtime IT partner Bentley Systems for a solution. Bentley, a strategic, global independent software vendor and Microsoft® Gold Certified Partner, provides software to the architectural, engineering, and construction (AEC) companies that design, build, and operate the world's essential infrastructure. The company's portfolio for its building, plant, civil, and geospatial industries spans AEC and operations (AEC/O), with annual revenues exceeding U.S.\$400 million. Since 1993, Microsoft technology has been the foundation on which Bentley builds its CAD and engineering solutions for infrastructure project management professionals.

Bentley suggested ProjectWise, an engineering project team collaboration system for connecting people and information across distributed teams. Although Barge Waggoner had considered ProjectWise in the past, in 2004, Bentley released a version of ProjectWise that made it possible for each of Barge Waggoner's many complex projects to be stored in an individual site. Newby says, "When they came out with a version that used Web parts for Microsoft Office SharePoint® Portal Server 2003, it inspired the concept of creating individual project sites. That's when we

started to implement ProjectWise integrated with SharePoint Portal Server.” With ProjectWise Web Parts, SharePoint Portal Server users can display ProjectWise managed content alongside content from other systems on a SharePoint site. Today, ProjectWise is integrated with Office SharePoint Server 2007.

A project site is a shared intranet workspace created with Office SharePoint Server where teams can access all the information for a project—such as financial and schedule information, and engineering and construction documentation—regardless of whether the documentation is located in ProjectWise; one of Barge Waggoner’s other systems; or in another network location. SharePoint Products and Technologies support rich, interactive business intelligence dashboards that assemble and display business information from disparate sources by using built-in Web parts. These Web parts include dynamic key performance indicators, Microsoft Office Excel® 2007 spreadsheets, Microsoft SQL Server® Reporting Services reports, and a collection of business data connectivity Web parts that can display information residing in line-of-business applications. Employees can also use project sites to communicate and collaborate across teams.

Access to Information and Software

Office SharePoint Server 2007 delivers an integrated suite of enterprise-scale capabilities for portals and collaboration in ProjectWise, plus information sharing and discovery. For Barge Waggoner, this facilitates the streamlining of business processes and performance management for every person involved in an infrastructure project. Office SharePoint Server 2007 supports all the intranets, extranets, and Web applications across the firm within one integrated platform that provides interoperability as an extension of the

platform services in the Windows Server® operating system.

Thanks to the interface in Office SharePoint Server and the flexibility with which employees can select, position, and access Web parts, a browser interface is all that is required to launch an AEC/O project desktop that is integrated with all other enterprise IT systems on Barge Waggoner’s corporate networks.

Barge Waggoner can use ProjectWise Navigator to offer visual collaboration, design review, and analysis capabilities to its project teams inside the office and on the road, and to its clients who may not have access to MicroStation and AutoCAD applications. ProjectWise Integration Server provides secure and managed project collaboration and delivers enterprise-level engineering content management solutions. With this federated approach to content management, employees can search disparate content management stores from the ProjectWise interface to find the appropriate files wherever they are located—even without identifying a master file that references them. Item-level and document-level permissions make it easy to control who has access to what content and help ensure secure information sharing. Joe Croser, Global Marketing Director of Platform Technology for Bentley, says, “ProjectWise is the first solution to provide full reference-file handling. This means that anyone, not just authors of AEC/O information, can search through CAD models and drawings and find the project information that they need. This eliminates the time-consuming and expensive frustration of unproductive searches, and it eliminates the need for unsuccessful information hunters to re-create from scratch the files that they fail to find. This alone dramatically reduces rework, saving time and helping the team more easily meet its project deadlines.”

ProjectWise caching servers are designed to optimize access to, and transfer of, information across locations, and to make sharing and updating files across a WAN quick and accurate. The net result for Barge Waggoner employees is faster file access. And their file versioning problems are also solved. For example, the server that runs ProjectWise Integration Server, which is the main hub for the ProjectWise collaboration system at Barge Waggoner, is located at the company's headquarters. If someone in the Knoxville office connects to the system to open a project file, ProjectWise Integration Server first checks the local Caching Server. If a copy of the file is already cached locally, and if that file has not been subsequently changed at its master location, then the system quickly serves the local copy from the Caching Server. The content management features of ProjectWise Integration Server also prevent more than one person from editing the same file at the same time.

Barge Waggoner can also publish documents on the Web for clients to access. Thanks to integration with the 2007 Microsoft Office system, ProjectWise offers efficient change management and automation of document review and mark-up during the quality-control sign-off process. This reduces the time taken for a series of people to review and approve information by routing a given document to an appropriate person the moment it has been preapproved. Users can also choose to be notified anytime someone makes a change to a file, or they can get a summary of changes daily, weekly, or the next time they open the file.

Another key element of the solution is Microsoft SoftGrid® Application Virtualization, which Barge Waggoner's IT staff can use to virtualize applications and deliver them as an on-demand, streaming service to desktop users. Newby says, "SoftGrid appealed to us because our vision statement in the IT group

is 'location does not matter.' That means that we want to provide access to the same software and services to everyone, whether they're at our headquarters or in a seven-person office in Montgomery. It also means that no matter where you are in the firm, your time, expertise, and talents can be applied to any project."

Licensing and Deployment

Once Barge Waggoner decided on a solution, it considered costs and implementation. In 2002, the company was one of the first to sign a Bentley enterprise License Subscription (ELS). Newby says, "With our ELS, we were able to load and utilize Bentley software throughout the firm, without having to pay the hefty acquisition costs we would otherwise incur. Anybody in the firm who needed the software could have it."

Barge Waggoner configured and tested ProjectWise for its IT environment. To maximize network performance, it installed WAN accelerators to combine the caches and storage for each project site into a single location. The IT department tested the new solution in a lab environment, and then launched a pilot for a small group of users. After a few more adjustments, all users were trained on how to use ProjectWise, which was then deployed across the company. The IT department made post-training support videos available on the network, for users who needed a reminder on how to perform basic tasks.

Benefits

Barge Waggoner now has a managed environment in which employees can confidently share, synchronize, and secure information. They can use the Office SharePoint Server-based technology in ProjectWise to efficiently manage content and business processes, support better-informed business decisions and improved response to customers, save time finding the

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Paula Harris, Corporate Marketing Director,
Barge Waggoner Sumner & Cannon, Inc.

right information regardless of its location, and more easily work together across boundaries. The company has also realized significant cost savings.

Better Collaboration and Information Discovery

Teams use the project sites to quickly search all relevant files. For example, the marketing team puts a calendar of events on each project site, to quickly see where exhibits are planned and who is going to attend. Employees can click on the calendar to get the agenda, venue information, and more.

Versioning problems are a thing of the past. Harris says, "We are much more efficient and able to focus on different service areas more effectively because we have the most relevant and up-to-date information in one place. People from different offices can work on the same file without worrying that their changes will be lost. This allows me to put my best people on a proposal, regardless of where their home offices are. We have improved our quality control because we can share suggestions and fixes through the process—corrections don't all happen at the last minute."

The people at Barge Waggoner now use ProjectWise to effectively reuse components and subassemblies in new product designs, and to gain better visibility into the design process. This results in fewer corrections at the end of a project, when corrections are more expensive to make. For example, the architecture for one project was done in Dayton, Ohio, and the civil engineering was done in Birmingham, Alabama. The civil engineer used the architecture background as a reference file to connect the downspouts and rain leaders off a building. Newby says, "Thanks to the file-change alerts and summaries in ProjectWise, she opened up her file one morning and saw that her rain leaders were still there but that the door and

the gutters had been moved 10 feet away. She called the architect and persuaded him to move the door back to the original location. That's something that we might not ever have caught before the final quality control review, and at that point, it would have cost us much more time and effort to correct it."

More Efficiency, Less Need for Travel

Barge Waggoner expects significant savings from the new solution by better connecting employees in distributed locations with the project information that they need. David Davidson, President and Chief Operating Officer of Barge Waggoner, says, "People not being used 100 percent of the time is costly and inefficient. With ProjectWise and Office SharePoint Server, we've been able to increase utilization and raise the revenue per employee by approximately 25 percent."

Bentley has found that people who work in organizations that use ProjectWise caching servers save an average of 20 minutes per day through quicker access to files. At Barge Waggoner, Croser says, "the average project team is composed of 10 to 25 people. At 20 minutes saved per day per person, that's up to 8 hours of productivity gained per day per project team."

With improved collaboration, people from different offices can work together at the same time from a single project site with full visibility into project files. Harris says, "I was able to hire a wonderful employee in our Knoxville office thanks to the Bentley tools. She could not move to another city to work with our corporate staff, but we were able to integrate her seamlessly into what we do here." Also, because clients can use ProjectWise to view drawings and specifications during projects, the firm spends less money shipping diagrams and documents. Davidson says, "It may sound like

a small thing, but when you multiply that over a \$50-million-a-year corporation, it adds up.”

IT staff now spend a fraction of the time that they used to on making software accessible to employees who travel among offices, both through virtualization technologies and thanks to reduced travel. In fact, the company’s technology solution is so efficient that, despite a drop from 517 employees in 2000 to 400 employees today, Barge Waggoner has an IT support staff of just five people; the industry standard is a staff of at least 12 support people for an organization of this size.

Improved Business Insights and Customer Service

The company can better respond to its customers. Davidson says, “With ProjectWise, our clients have real-time access to project files. When clients say, ‘Oh, now that I’ve seen this, I want to change it,’ even in a dispersed team environment, ProjectWise makes it possible for us to respond with updates almost instantaneously. We can quickly capture and respond to important feedback from our clients to make sure that they are satisfied.”

Project managers can track project costs more closely with ProjectWise. Newby says, “We used to have very little financial reporting for project managers. And now it’s like trying to drink from a fire hose—they have more data, faster and more accurate, than they’ve ever had. They can sort through it easily to look at just the information that they want.” The firm uses this information to improve its bids on new jobs.

Harris adds, “We used to have stacks of slick, four-color brochures from the printers, but they would get outdated within a week because we need to customize and update our materials constantly. Now we put our service brochures on the SharePoint sites to

print on demand, in just the quantities that we need, and customized to each client—instead of printing hundreds of something that is more generic.”

For More Information

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For more information about Bentley Systems products and services, call (800) 236-8539 or visit the Web site at: www.bentley.com

For more information about Barge Waggoner Sumner & Cannon, Inc. products and services, call (615) 252-4312 or visit the Web site at: www.bargewaggoner.com

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For more information about Microsoft solutions for the AEC industry, go to: www.microsoft.com/resources/manufacturing

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 - ProjectWise Caching Servers
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