Site civil technology automation

Multi-year project successfully aligns firm's technology with its business strategy.

By David Palumbo, P.E.

When it comes to land design, many in the industry consider Dewberry as having "written the book." Figuratively, because of the company's achievements in land design, and literally, because Dewberry's founder and chairman, Sidney O. Dewberry, P.E., L.S., authored "Land Development Handbook: Planning Engineering, and Surveying." The handbook was published in 1996, before the recent maturation and rapid convergence of several key site civil technologies, including global positioning systems for survey, laser scanning, geographic information systems/asset management, and integrated 3D-object-oriented design.

But with 2,000 multi-disciplined professionals in more than 40 locations nationwide, Dewberry's site civil service line had become somewhat fragmented in its standards, hardware and software tools, and work flow. These inconsistencies hampered Dewberry's ability to share expertise and work company wide.

To help achieve Dewberry's strategic planning goal for growth, business and technology leaders supporting Dewberry's site civil service line organized to unify operations and evaluate how to take advantage of modern site civil tools. Dewberry formed a technology automation focus group of approximately 40 management and technical employees from various offices. The focus group's ultimate goal was to develop a unified site civil work flow supported by modern digital mapping and design tools, while enabling seamless work sharing across geographies.

Establishing expectations

In April 2007, Dewberry's technology automation focus group met for the first time with senior site civil management, as well as Ronald L. Ewing, P.E., R.L.S., CEO, and Henry J. Tyler, chief information officer. During this meeting, senior leaders set the following clear expectations for the group as it began the two-year project:

- be open-minded and objective throughout the process;
- set aside all personal preferences for local work flow and aging tools;
- be willing to participate actively with hand-picked peers to develop a single work flow and task specification; and
- define how Dewberry site civil professionals will operate.

The focus group's responsibility included evaluation of administrative and implementation matters such as software license model; license distribution and management; Dewberry network compatibility; and software distribution, configuration, and version upkeep processes; as well as creation of a formal transition and training plan that respects the variety of existing work flows and tools at Dewberry (see Figure 1).

Composition and coordination

The focus group's efforts were organized and managed by project managers with civil and survey technology backgrounds. With no additional client responsibilities, the project managers were dedicated to the task. The focus group used formal project management tools such as a written plan, work plan and schedule, and team websites to facilitate communication and provide access to project documents, standards, contact information, and administrative surveys.

The focus group's technical team members convened several times at Dewberry's Fairfax, Va., headquarters. This face-to-face dialogue involved development of the site civil task specification and standard work flow. The meetings lasted for several days and included multiple break-out sessions for specialty groups within site civil disciplines. These sessions provided knowledge-sharing and team-building experiences, proving that site civil work flow was largely the same. In some cases, jurisdictional differences were identified, but often, personal and historical preferences were uncovered and managed appropriately.

Taking advantage of maturing technologies

Unlike earlier adoptions of site civil automation, the focus group recognized that converging technologies were mature enough and available from multiple vendors, presenting an opportunity to acquire technology that fit Dewberry's needs. Previous technology choices were more limited and work flows were adjusted around the deficient market-available tools. Dewberry was not immune to using non-integrated, multiple-vendor hardware and software solutions, and these limitations had created quality control concerns, as well as administrative inefficiencies.

Once the focus group had identified how the site civil disciplines wanted to work, three major industry vendors were asked to propose solutions. Vendors and the entire focus group convened

at Dewberry headquarters for three successive, four-hour presentations over a two-day period. The initial sales presentations were structured to allow each vendor to prove how its solution best met Dewberry's specification and work flow and typically involved standard data and slide presentations. The focus group required that each solution was presented by a software manufacturer's team, not resellers or third-party representatives. Vendor teams typically included technical experts and management representation to discuss licensing and support.

Testing possible solutions

Immediately following the initial vendor presentations, Dewberry required that vendors visit selected offices to put their solutions to a test in front of a larger site civil audience. Vendors were challenged with a local Dewberry data set and documented list of project challenges experienced while producing deliverables using then current work flow and tools. The information was supplied by the local office's focus group representative, and vendors were asked to present how their solutions worked with Dewberry's data and project challenges. Presentations lasted from one to two hours and normally included separate survey and civil breakout sessions.

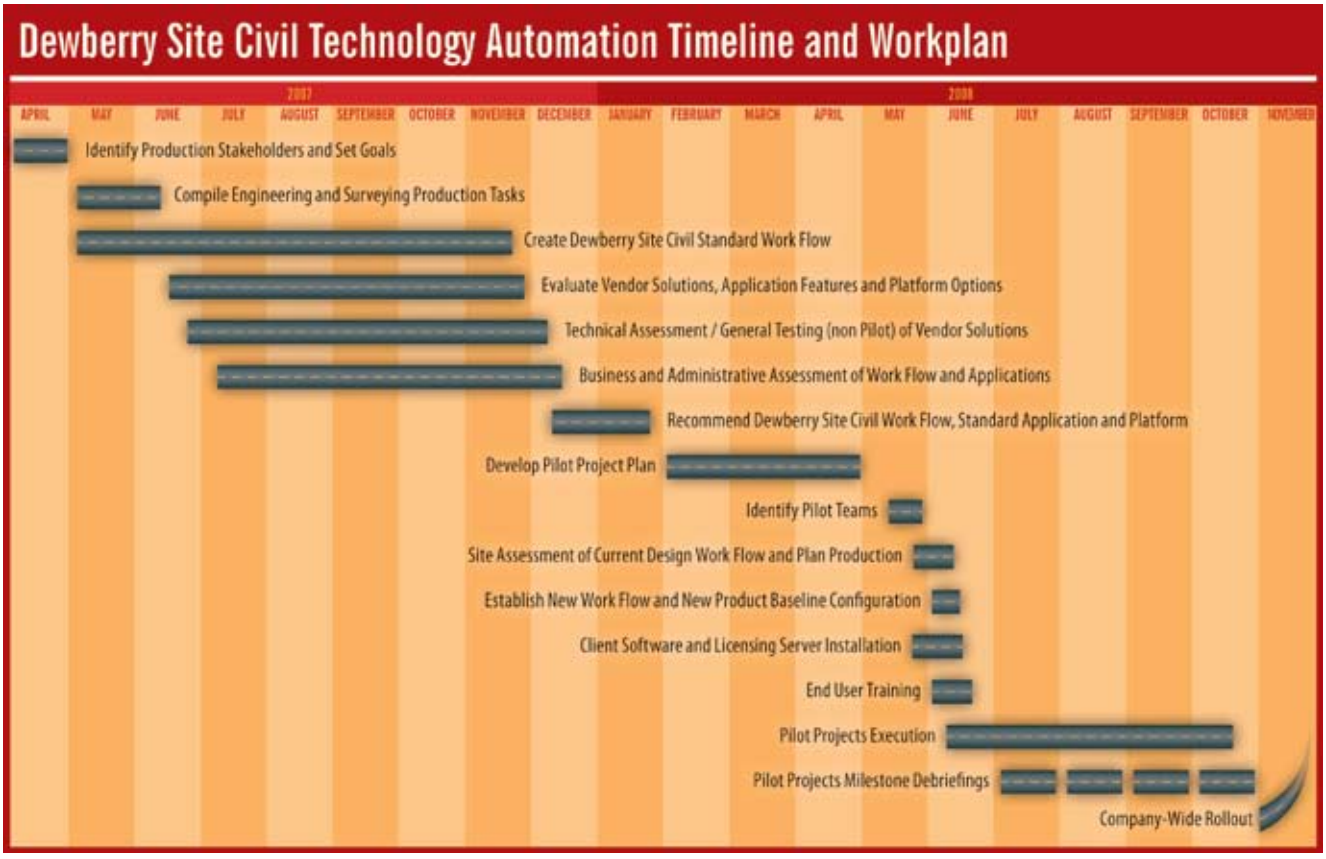
These tests proved very effective in exposing the strengths and weaknesses of the solutions. The vendors had limited time to process the project data and relied on their own knowledge of site civil work flow, supplemented by the abilities of the software, to demonstrate that their solution could improve work flow and efficiency. Each vendor performed a minimum of five office proofing events.

Reevaluating the evaluation process

Vendors were then judged by the focus group members. Both qualitative and quantitative assessments were performed, with qualitative reviews linking to individual office historical perspectives. The use of qualitative reviews, such as "good," "better," and "best" complemented by detailed explanations about a vendor's solution, made it impossible to choose a winner objectively.

Therefore, the focus group was asked to reconvene in person and perform a quantitative assessment using numerical rankings cast immediately after team discussion on each site civil

Figure 1: The two-year planning, development, and implementation process included capturing feedback from multiple site civil disciplines and testing vendor solutions in Dewberry locations nationwide.



Top 10 integration tips

1. Secure expectations and buy-in from C-level and business unit management.
2. Identify a team of change managers to help drive and ultimately impart ownership of the work flow.
3. Understand your company's history and plans for the future in addressing solution needs.
4. Insist on objectivity during evaluation.
5. Require presentations from software manufacturers, not third parties.
6. Execute multiple solution tests with the end-users.
7. Gain real consensus, not just a majority, on the winning solution.
8. Pilot-test the training and implementation plan.
9. Foster collaboration during the early company-wide adoption period.
10. Revisit solution alignment with work flow regularly.

specification task, while being mindful of the product's alignment with the desired work flow. This quantitative system cut through personal preferences and helped the group identify which solution best aligned with the objective. Ultimately, the decision was not based on a number but a final vote cast by a show of hands. As expected, the final vote directly reflected the quantitative rankings.

Finalizing the recommendation

Dewberry's focus group selected Carlson Civil Suite as its comprehensive site civil solution. As requested, Carlson's solution also included a transition plan proposal and training program. The focus group prepared and submitted a formal recommendation to CEO Ewing. The document included cost estimates for software acquisition and maintenance, as well as the extensive training program.

Ewing, along with Chief Information Officer Tyler and senior site civil management were active and supportive members of the entire process. Their participation at significant milestones proved valuable and motivational for the focus group members and helped accelerate the process.

Evaluating pilot testing and training

Before investment in a company-wide roll-out could occur, the focus group planned and implemented pilot testing during the summer of 2008. The new site civil work flow was tested within two Dewberry offices on full-service projects. Dewberry's Fredericksburg, Va., and Lanham, Md., offices were selected, and the office units incurred the cost to implement the pilot. Office management understood that adopting the new work flow would ultimately result in quicker returns on investment. A third, survey-only pilot was also launched in Dewberry's Leesburg, Va., office. Pilot teams were able to learn more about the new product directly from Carlson's best technical leads. Not unexpected, Dewberry's current production technical leads helping to manage standard software configurations have come from the pilot efforts.

Pilot teams also evaluated the Carlson-recommended training program. A five-day program was proposed for survey computers and civil engineers. As a result of the pilot training debriefings, Carlson developed specialized training for plan production, field survey, hydraulics and hydrology, planning, landscape architecture, and project management.

The pilot project teams ultimately defined Dewberry's training curriculum, created the initial Dewberry standard configurations for survey and civil, and provided confirmation that Dewberry should move forward with company-wide roll-out.

Launching the new work flow

Starting in November 2008, Dewberry began the training and transition of approximately 325 site civil employees to the new Dewberry work flow on Carlson Civil Suite. All employees in the pilot offices were first brought up to speed, and Dewberry business units in close proximity to one another were able to share training costs whenever possible. Training was completed in early May 2009.

To support the ongoing learning process, the focus group created a collaborative website to foster communication between offices and users of the work flow and software. Resources available to staff on the website include contact information for internal and external support, information on Dewberry standards and work flow, links to external and internal content for training refreshers and CAD resources, and a discussion board where staff can post and seek information on suggested improvement and enhancement requests.

Moving forward

Dewberry's transformation of site civil services to a full 3D integrated work flow occurred during the largest site civil market downturn in years. However, Dewberry's executive management never pulled back support for the project, knowing that the costs were an investment in Dewberry's future. Dewberry expects to be fully engaged in the new and more efficient work flow when the market returns, and early adopters are already reporting an improved product, better cross-discipline integration, and man-hour savings. ■

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