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How Webcor Builds on Collaborative Tech

By Margaret L. Young

WEBCOR BUILDERS

Corporate Headquarters |
San Mateo, Calif.

Year founded | 1971

Top IT Exec | Gregg Davis,
senior vice president Webcor
Technologies

IT employees | 19

Revenues | \$1.152 billion in
FY 2001, down 24.6% from
\$1.528 billion in FY 2000

Sure, earthmovers still dig out the foundations, hard-hats still haul two-by-fours, and heavy machinery still hoists steel I-beams high into the air. A typical construction site, right? If it belongs to Webcor Builders of San Mateo, Calif., don't be so sure. High-speed Internet connections inside Webcor's job site trailers and Palm computers hooked to the belts of some construction workers do even more of the heavy lifting. Each device and high-speed data line is linked from the field to Web sites created especially by the construction company to help manage each of its building projects in real time.

Webcor's use of information technology has put it at the bleeding edge of change in the \$3.5 trillion global construction industry. The company uses wireless devices and customized software to connect the dozens of partners on a construction project, and help them know in seconds, for example, if a steel shipment has been delayed or a heavy thunderstorm is idling workers at a remote job site. At any one time, Webcor has 40 or more Web sites active for each of the jobs it manages.

Construction isn't known for being a tech-smart business, but Webcor offers up one of the few examples of digital project management in industry today: Architects, engineers and electricians located in far-flung locations now have immediate access to each other and to complex drawings—and can make incremental changes as a project progresses without adding costly delays.

Sure, construction crews everywhere now use mobile phones and computers back in the home office. But Webcor's technology innovations go beyond the norm. The company—named in 1971 not for the Web but for the initials of its founders—was one of the first to use information technologies to change the way buildings are built. The company continues to use databases, custom software and strategic alliances with technology partners to redefine what it means to collaborate using networking technology. Says Martin Fischer, director of the Center for Integrated Facility Engineering at Stanford University: "Webcor has made the importance of sharing data electronically very clear—and it's changing the mindset of the industry long-term."

Webcor's goal, though, is all about the bottom line. Rising labor and materials costs have spiked the price tag for building materials by one-third, on average, between 1995 and 2000, and labor costs by 20 percent, says CEO Andrew Ball. While the recession has caused materials costs to drop by 10 percent, labor costs are locked in by union contracts. In an industry where profit margins are 2.5 percent to 10 percent, the pressure to cut costs remains strong.

"The name of the game in a climate of constant cost-squeezing is doing what you can to boost your productivity," says Ball. "You've got to innovate to survive." Webcor can use e-collaboration technology to cut construction costs by up to 4 percent, Ball says, and save about \$12,000 per month in lower overhead costs and worker downtime.

Time savings also can be dramatic. When Webcor accepted the job to build the Serrano Hotel in San Francisco, Ball thought it would take 12 to 14 months to finish. But by signing up subcontractors willing to use Webcor's e-collaboration technology, Webcor was able to speed architect approvals and crunch job hours to work more efficiently. In the end, it took Webcor just 10 months to finish the hotel, which translated into more than \$100,000 in savings for Webcor in overhead and some \$1.5 million to the Serrano's owners—because they were able to open for business a full month earlier than expected. Another Webcor customer, John Igoe, vice president of real estate at Palm Inc., estimates that Webcor was able to reduce the design development stage of the Palm campus in Silicon Valley by 15 percent. The ability to look at blueprints online

was particularly valuable, Igoe says, because the project's design leader and landscape architect were located 2,500 miles away from the project's architect and Webcor.

Flexible Construction Schemes

E-collaboration also has enabled Webcor to build different types of buildings for less. When computer games maker Electronic Arts Inc. began planning its new \$66 million headquarters in Redwood City, Calif., Webcor thought it was going to be just another pair of Silicon Valley office towers—steel frames, eight and five stories, 25,000-square-foot floors and power conduits hidden in the ceiling. Three years later, however, those two buildings, scheduled to open in June, have turned into a single, four-story building with enormous 75,000-square-foot floors. Instead of a steel frame building with dropped ceilings, the building has a concrete frame with raised floors—a type of cutting-edge construction used in Japan and Europe that is almost unheard of in the U.S. Raised-floor concrete costs about \$7 a square foot more on average than traditional steel frame.

Webcor's aggressive use of databases, Internet communications and Web platforms not only made the design change feasible, it also helped to keep the EA project on schedule and on budget. Managers were able to calculate that concrete was, in fact, a better deal once the six-month waiting period for steel and concrete's long-term cost efficiency were factored in. Cost estimates that once would have taken 15 hours were set in minutes as managers accessed Webcor's online databases. "The ability to challenge our ideas in real time helped a ton," says Dick Madden, Electronic Arts' director of capital projects. "Without the constant input and review we had, we would have probably stuck with a steel frame. We wouldn't have known concrete was a better solution."

E-Collaboration Challenges

Still, there are challenges to getting e-collaboration right. According to Ned Kock, director of the E-Collaboration Research Center at Temple University's Fox School of Business and Management, online collaboration—used by companies from Motorola Inc. to Unilever and Ford Motor Co.—is still very new, and the challenges of managing it can be tough.

E-collaboration works best, Kock says, when the information that parties are sharing is mostly about numbers, specific measurements and cost data—quantitative data that won't, like complex knowledge concepts, suffer from the lack of face-to-face communication. "The biggest challenge right now to managers with e-collaboration is deciding which stages of a project work best using digital collaboration, and which stages require the kind of trust, clarity and nuanced communication that only face-to-face communication can give," Kock says.

Management style also has to change to accommodate e-collaboration, he says, from top-down styles to those which are more democratic. "People tend to be much more outspoken electronically, and your ability as a manager to control who contributes and when is much lower," he says. "People much lower in the hierarchy now make contributions, and you've got to change your management style to accept this. It's not easy for many companies."

The biggest mistake, Kock says, is to "fall into the trap of thinking a project can be conducted entirely electronically." Successful e-collaboration, he says, is finding the right mix of personal and electronic linkages.

Forging the right relationships is an ongoing challenge in the construction industry any time. Buildings, unlike cars put together on an assembly line, are the result of thousands of choices dependent on thousands of variables, even the quirks of a particular architectural firm or the unique requirements of a door supplier. Building codes can differ from state to state. And what can look like two identical buildings can be radically different in both construction and cost: One might be built on bedrock, another on landfill. Or, there might have been a surplus of steel when one was built, and a six-month delay in steel shipments during the construction of another. "If

manufacturers had to do what we do in construction, they'd all go out of business," says Jon Antevy, CEO of e-Builder Inc., a creator of project management Web sites in Fort Lauderdale, Fla.

All of which means that the construction industry offers a unique set of both opportunities and challenges for collaborative networking technology—and for managers seeking to use it. While collaboration networks are particularly useful for getting dozens of parties on the same virtual page, the unique needs of each project make it hard to develop a standard networking approach. And in the tradition-bound construction business, technology change can come hard. "The majority of the industry still doesn't understand the need for a collaborative Web space," says Paul Doherty, founder of The Digit Group, a Memphis, Tenn.-based firm that advises large property owners about technology. "For many, the highest level of collaborative technology they know is the fax machine."

A Financial Cornerstone

At Webcor, technology is the core of the business strategy. Ball's mission: to be a catalyst for industrywide change. Webcor sees new revenues from taking that kind of leadership. The strategy is behind Webcor's moves to fund start-ups to get blueprints online, push software vendors to collaborate and, starting this month (May 2002), sell its own software to others in the industry. Ball admits it's a long and winding road. "Pushing technology in this industry means forcing it, sometimes, on subcontractors," he says. But the way Ball sees it, it's innovate now, or get hammered later on the balance sheet. "The construction industry is one of the few paper-heavy industries left. As a result, its culture and processes are ripe for change."

Webcor's technology strategy all began in 1981, when Ball was working as a project manager on the Hilton Hotel in Irvine, Calif. There, he devised a way to track orders and budgets on his PC. Back then, such tracking was usually done on paper, sometimes on matchbook covers, and rarely circulated beyond one man to another. Ball, though, began typing project data into his computer and circulating printouts at meetings. "For the first time, everyone began seeing why there were delays and what, specifically, was causing cost overruns," Ball says. "It was enlightening but it also was scary, as accountability to that degree was never a reality in the business before." The experience, he says, made him realize "the power of computers." Today, Ball's vision of using IT to cut costs and build better buildings rages on. And no wonder. "A project scheduled to take 16 months in 1995 is now scheduled to take 14 months," he says. "The demands are greater."

For Webcor, the e-collaboration happens in a variety of ways (see sidebar). Consider blueprints. Some 4,000 separate blueprints, or 40 100-page sets are issued each time a change is made to a building. Getting them drawn up and approved each time, by architects, developers, owners, the general contractors, engineers and city planning departments—can cause hundreds of sets of blueprints to be issued in the course of a large project.

Webcor figured out a way to get blueprints online. "Before," says Ball, "you would have looked at maybe five ways of doing something over a six-month period. Now you can look at a hundred different ways of doing that in the same amount of time."

Once a construction project has begun, Webcor must track everything from the latest weather report to the price and delivery of materials to the scheduling of dozens of subcontractors ranging from plumbers to carpet layers to electricians. A logistical nightmare, right? "Andy was the first general contractor to tie all of his site offices to the general office through high-speed data lines," says Woolsey McKernon, formerly vice president of North American sales at Citadon Inc., a former Webcor vendor. "A lot of general contractors still don't do that."

Webcor also uses accounting software by Timberline Software Corp.; project management software by Meridian Project Systems Inc; BuildPoint.com, an online bidding site; and PlanWell, a

Web site for storing blueprints. While Webcor is hardly unique in using these services, Ball is encouraging all four providers to collaborate. For example, he's pushed BuildPoint to create a link to PlanWell so that would-be bidders on a project can check out a project's blueprints before bidding. BuildPoint agreed, and the link went into operation in March. "Everybody can bid equally, and we know who has the blueprints and when they got them and how long they've had them," Ball says. "If a new drawing gets posted, they can all see it together, and it's all tracked through this one system."

Ball, meanwhile, is trying to persuade Meridian to link its project management software to Timberline's accounting software, to create a way for Palms to access and distribute project management information quickly from the field. Where Palms are used now in the process, Webcor can reduce the support staff on a \$50 million project from 20 people to 10 because time cards, safety checks and labor distribution reports can be punched in and downloaded to the job site computer laptop and transferred to Webcor's main computers. Previously, a clerk had to go out to the site, retrieve the handwritten data, drive back to Webcor and then get a secretary to type the information into the computer.

Creaky Ceilings

Yet while Webcor has clearly benefited from collaborative networks, it hasn't been easy for the company to create them. Webcor's attempt to be one or even several steps ahead of the competition in the technology race has had its price. Rivals claim that sometimes, Webcor pushes new technologies too aggressively. "Should they be telling people it's wonderful before they've tried to make it work?" asks Charlie Kuffner, senior vice president of Webcor competitor Swinerton Inc., a construction company in San Francisco.

Ball acknowledges that Webcor's technology push has triggered cultural resistance—or simply head-scratching among those who don't see the potential benefits. Even now, Ball says, subcontractors sometimes "e-mail everyone that they're going to have a meeting but then set up a physical time and place, show up physically, take paper notes and then tell everyone they'll get feedback on what happened at the meeting a week later, in memos or word of mouth. It's frustrating."

And sometimes, Ball says, it's hard to get others to invent the product you need. Take Citadon Inc., for example, a company that Ball hoped would develop online project management software for general construction. Ball's involvement with Citadon shows how using e-collaboration sometimes means making some technology mistakes—and suffering resistance from tech-wary workers who may be skeptical about new ways to work.

Six years ago, when Ball met the founders of Citadon's precursor, Blueline Online Inc., Ball was so impressed with its plans to make blueprints accessible via its ProjectNet software on the Web, that Webcor became its first investor. Soon, Webcor also became ProjectNet's primary beta tester. While Blueline's product wasn't perfect, Ball figured he was on his way to getting what he wanted. He was wrong.

Two mergers later, Webcor was no longer a major investor in the company known as Citadon, and Citadon had changed its customer focus away from general contractors like Webcor to big international industrial builders like Bechtel Group Inc. Ball found himself unhappy with both the new management and the product, and ended the relationship. As Ball sees it, Citadon had become more interested in looking good for an IPO than in fixing the bugs in its software. The final blow came one Monday morning when Webcor managers logged into the Citadon project management site and found that a key module had been changed and no longer worked. For Ball, that was the last straw.

The Citadon experience also held some lessons for Webcor about managing change. According to former Citadon Vice President McKernon, there had been a struggle getting all of Webcor's

subcontractors to use ProjectNet. Though plumbing, mechanical engineering and electrical engineering subcontractors were willing and able to get on board, smaller, less-technologically sophisticated subcontractors were not.

Ball, though, wasn't discouraged. Rather than look for another start-up to bankroll, Webcor acquired its own networking company, Hayward, Calif.-based BridgeNet Information Systems Inc., now known as Webcor Technologies and Webcor's technology development arm. In addition to creating connections between Webcor's internal systems, Webcor Technologies' 19-person IT staff also does technology consulting for 200 clients in the construction industry. This month, it was scheduled to introduce its first product, iPortal, an online employee-management database to help workers submit time cards via their Palm devices. "We're going to a completely paperless system," says Gregg Davis, Webcor Technologies senior vice president. "No more matchbook covers, no more torn cardboard paper. It's all going to be done on the Palm."

Will Webcor's plunge into the networking business continue to push the construction industry into the digital age? Maybe, but Stanford's Fischer says the proof will come when IT stops being a separate department or subsidiary and becomes an essential part of the core construction business at most companies. "We need to set the mindset differently. IT is still seen a bit as an appendix," says Fischer.

Ball, though, is looking for the next big innovation, such as programmable blueprints and what he calls "smart drawings"—computer programs that could let builders make most of their mistakes virtually instead of in actual production. Instead of a wall being represented by two lines on a blueprint, e-blueprints would make the wall appear as a smart object on a computer screen. A quick click on it would reveal the wall's characteristics, while ill-conceived attempts to change the design, like adding a doorframe that wouldn't fit, would be rejected. "You'd be able to realize pretty quickly, without spending a cent, that one piece of conduit is not going to go through a certain steel beam," Ball says. A big concept, indeed—but really just another strategy blueprint for one of the industry's most risk-averse innovators.