

# THE ARCHITECTURE INDUSTRY REDESIGN

New tools such as virtual reality and drones drastically alter how architects work. [Bill Kloster](#), principal and CIO with [Short Elliott Hendrickson Inc.](#), marvels at how innovation has changed since his father designed buildings just twenty years ago.

By Peter Fabris

**Bill Kloster often reflects on how the tools and practices of the architecture profession** have changed in just the past quarter century. Kloster, principal and CIO with architecture/engineering firm Short Elliott Hendrickson Inc. (SEH), recalls that his father, an architect, had just one technology gadget that he relied on: a Polaroid camera.

Compared to the tools available to architects today, such as augmented reality, virtual reality, drones, and CAD, architects of Kloster's father's vintage might as well have been equipped with stone knives and bearskins. Having started his own IT career in the financial services industry twenty years ago, Kloster didn't seriously consider that he would be working in the architecture

field someday—that is until the recent flourish of high-tech tools in the field made his skills particularly valuable to a design firm. This development—along with his admiration and respect for the work of architects, which stems from his childhood observances of his father's work—prompted him to join SEH two years ago.

In that fairly short time, Kloster has seen how new tools, such as augmented reality, can impact the profession and the firm. For example, SEH created an impressive AR presentation for a proposal for a quarter-mile boardwalk landscape project in Indianapolis. The 3-D video highlighted the features designers wanted to construct for the project, giving viewers an immersive experience of walking along a renovated waterside promenade.



“In the past, we would have given out hard copies of the plans or made a PowerPoint presentation or constructed a model,” Kloster says. The AR presentation, though, imparted a much more vivid feeling and had a much greater impact. “It’s a big part of how we won the project,” Kloster says.

Implementing and supporting such new technological capability occupies much of Kloster’s time. Digital tools can now make every step of a project—site evaluation, design, construction, and storage of project documents—much more efficient and of a higher quality.

The impact of new technology is evident right at the beginning of a project when engineers examine a site. They capture key data, including measurements and

features of the landscape, on mobile devices. Instead of a Polaroid, specialists snap photos with their smartphones and attach notes to these files. Additionally, 3-D laser scanners allow technicians to see through walls when doing site inspections, which allows for better, more accurate designs on renovations. Engineers can also use drones equipped with lidar to capture highly accurate topographic data.

“There are mobile applications that capture location and measurements to within a centimeter’s accuracy,” Kloster says. The information captured on site is immediately uploaded to a central server that is available to anyone with a network-connected device. Using Newforma, an email and file-management system

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specifically tailored for design and construction firms, architects, engineers, and draftspeople access and share all project documents electronically.

Because design files—computer-aided design documents, 3-D renderings, and high-definition photos—contain much more data than typical business documents, standard file-sharing technology won't do. Instead, SEH uses Panzura Cloud FS, a system designed for unstructured data storage and real-time collaboration over the cloud, to allow designers in different locations to collaborate using the same documents.

The Panzura product stores files locally after downloading from a central point, and when revisions are made to documents, only the changes are transmitted over the network. "You don't have to constantly transfer huge amounts of data over wires," Kloster says. The system also allows construction contractors and owners to view the documents, which makes for a huge leap in efficiency over communicating by email and paper documents.

During a construction project, it's common to modify designs while a structure is being built. The ability to instantly transmit design alterations to construction managers and workers saves time and reduces opportunities for error because everybody can instantly access the same up-to-date documents rather than having to sort through multiple hard copies of revisions to figure out which one is valid.

The design process, too, is enhanced with newer tools. Design software widely in use today enables the creation of more precise plans with the ability to automate many repetitive actions. For example, designers can change the dimensions of all the windows in a building in just one step.

Virtual reality tools, which are just starting to gain traction in the design and construction industry, take accuracy a step further. They allow designers and even owners to experience what it will feel like to walk through a building before construction

is complete. This produces several benefits. For the design team, it allows them to spot possible conflicts, such as having pipes too close to a wall in a wastewater treatment plant, which would allow plumbers no room to turn a wrench. Those design errors are easier to spot in a virtual 3-D rendering than in standard CAD design plans.

VR can also be a powerful marketing tool for owners, Kloster points out. "A condo developer can show prospective buyers what the building will look like months before it is completed," he says. This would help the developer sell out the structure faster.

To get the most out of these tools, design firm CIOs face several challenges. First, they have to gain support for investing in more powerful computers—both in the back-end and for employees in the field who will need robust portable units. But the biggest issue, Kloster says, comes down to allocating time for designers to get training on the new technology. Architects and engineers have to account for their time in billable hours, and the firm can't bill a client for new software training. One strategy Kloster says has been helpful is to create small teams of power users that try out new software and help to customize features that make it more useful and easier to use for others throughout the firm's thirty locations.

There may be an opportunity to turn something like VR creation into a profit center and make the investment in time to learn new skills worthwhile. A small team of VR specialists, for example, might be able to ply their work with real estate developers for marketing purposes, Kloster says.

How and when SEH adopts VR remains to be seen, but that and other IT advancements have made the position of CIO in the design and construction industry more important than ever. Kloster couldn't be happier about that. He has the opportunity to make a difference in the firm and, at least in a small way, influence the evolution of his dad's profession. ●