



ACCOMPLISHING a Paperless Jobsite

A FIRST-PERSON LOOK AT THE ISSUES AND
COMPLEXITIES FACING A PROJECT TEAM
AS IT ELIMINATES ON-THE-JOB WASTE.

By Graham Coddington



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PREVIOUS PAGE Site work can be much simpler without having to lug around pages and pages of plans.

BELOW Plans can be updated without requiring someone to make multiple paper copies afterward.

RIGHT Paperless jobsites can update the trades more quickly.

There has been much discussion about environmentally sustainable buildings over the past couple of years. However, we in the construction industry believe that we can do more than just build green with the intention of making resource-efficient structures. Nowadays, we also have the responsibility to incorporate this green philosophy throughout the complete building process — from the design stage to construction and completion. While it is commonly perceived that our industry has been slow in adapting to new technology and that many of us are somewhat set in our ways, it turns out that you can teach an old dog new tricks.

THE BUSINESS CHALLENGE

The opportunity to prove this case came in 2011 when my team at Saunders Construction began work on the new DaVita Headquarters in downtown Denver. The kidney care company recently relocated to the Mile High City from El Segundo, Calif. It was on this project that we decided to take our company philosophy of care, collaboration and commitment to the next level by going completely paperless with regard to construction blueprints and jobsite schematics. Like so many in the industry, we knew tablet computers were the way of the future. Up to the start of construction on the DaVita site, all of our company personnel still carried around four sets of paper drawings, which could end up being more than 500 pages in total for each set. In addition,



every time a design change or update was made on paper, workers would have to replace a page in their set. This was very time consuming, wasteful and not always well organized.

For information to be used on construction sites it needs to be accessible to the trade workers putting the materials in place. On a traditional construction project, this is done with various plan tables around the jobsite with paper sets of plans. Keeping these sets current with the correct information requires someone to take new paper copies to each plan table and update the set of plans when new information is issued. We discovered that the more efficient the process in disseminating information to the trade workers, the bigger impact to the project. To do this, we built a standalone digital plan table. Each digital plan table is portable around the jobsite and only requires a power outlet. At each station, this digital plan table has a large-screen television connected to a tablet computer. This setup allows all workers access to the most current information (e.g., plans, shop drawings, etc.) and can be updated with new information each night. By using these digital plan tables on the jobsite, we are now able to provide current information to the trade workers and reduce the time required for someone to update these plans.

THE RIGHT TOOL FOR THE JOB

Inspiration for this paperless jobsite change came from our Corporate Social Responsibility (CSR) team, several of whom were already involved in the DaVita project. At the time, our CEO was exploring new and innovative ways to do things, so he was very receptive to the idea of a paperless jobsite and gave it the immediate go-ahead. We researched several tablet computers on the market at the time and concluded that



BELOW *The earlier, the better when it comes to getting everyone on board with the notion of paperless.*

the Apple iPad was the best device suited for the task.

In the beginning we feared that this initiative wouldn't get much support or traction on the jobsite, but any concerns or misgivings we had quickly subsided when things started happening very rapidly. The site workers were very open to using an electronic device to view construction documents rather than the old paper alternative. In fact, our IT department went from getting the heads-up on the new initiative to being overwhelmed with the proposed change well before the project even started.

With the approval and cooperation of DaVita, we were soon using the jobsite as our test platform for the iPads, ensuring this worked as expected before moving forward to expand and implement this system onto the rest of our jobsites. By testing this paperless concept in a controlled environment, we were able to pick, choose and learn firsthand what worked and what didn't with the paperless migrations. Basically, we saw this jobsite as our field laboratory — a chance to experiment on an actual working construction site. We wanted to find the best software and equipment for this particular process, instead of just copying or expanding on what others were doing in this arena.

MAKING IT WORK

The move toward implementation of the new paperless system began in the preconstruction phase. Working with the design architect, we were able to get full-page documents of Computer Aided Design (CAD) files migrated in full detail onto our iPads. CAD provides for a streamlining computer design process via the computer. These files were then viewed with the help of Good Reader, a robust PDF reader with the ability to sync files to remote servers. Using this system, architects and designers were able to immediately get updated information to those in the field (or up on the construction scaffolding) without the loss of readability, time or image quality.

Onsite offices were also equipped with large, interactive TV screens of varying sizes so drawings could be referenced by the entire team at once. The drawings were pushed to the devices from one location so that everyone viewed the most current information. In fact, we found out that any iPad could be connected to the larger screens in the main site office for individuals to review, share concerns, and gather focus and feedback while keeping the drawings in complete sync. One of the challenges was finding the right type of software to make sure that uploads were correctly synced. As with the rest of this paperless initiative, trial and error involving the iPads led us to our solution, SugarSync — a file-sharing software program. It ended up being the best overall option. SugarSync allowed everyone to access and share all their files on-the-go, instantly and securely from any device. This worked so well, in fact, that only one set of drawings was kept in our central office for emergencies, such as loss of power.



STREAMLINING DATA COLLECTION



By Sean McCloskey

Building and construction projects rely on the collaborative effort of many partners, sharing tens of thousands of pieces of data. For the majority of organizations in the building industry, this vast amount of data makes collaboration with partners difficult at best.

New mobile technologies provide an opportunity to streamline this data collection. Devices such as the iPad allow for professionals to rapidly collect relevant information including photos and audio notes.

A recent survey of ecolnsight users identified that, on average, professionals that utilized the company's Mobile Audit for iPad app to collect building data were able to gather the data in 30-40 percent less time.

One ecolnsight customer, Mayer Electric, previously relied on pen, notepad and a digital camera to collect lighting systems data at a client's site. It has since shifted to the iPad because the technology allows the company to collect data more efficiently and to look more professional in front of clients.

Mobile auditing is paving the way for seamless sharing of information. There is no longer the need to spend hours or even days re-typing the information collected during a building audit.

For the full story on how mobile technologies have improved efficiency at Mayer Electric, visit <http://bit.ly/HBo4Qh>. For more information on ecolnsight's mobile and Web applications, visit ecolnsight.com.

Sean McCloskey is the CEO of ecolnsight, a provider of lighting audit and analysis software. For more information or to sign up for free, visit www.ecolnsight.com.

GETTING PEOPLE TO CATCH ON

As we all know, change doesn't always come easily. While some workers were very enthusiastic about the migration, others were not comfortable with the proposed change. One of the major issues we had to contend with was a concern over the actual hardware itself. Let's face it — while the iPad looks sleek and cool, it also appears fragile. Not an easy sell to a rugged concrete construction worker. This is where the education and trial process began. First and fore-

most, we let everyone know that (with some protection) the iPad could be dropped and withstand a certain amount of punishment on a jobsite.

For our field crews, we took the education process to the foreman level, where project engineers walked everyone through setup and use of the device, showing them how to access drawings and everything else that could be done with this new piece of technology. We also had to find ways to be innovative in the

way the device is carried around in the jobsite. For example, for a worker to climb construction scaffolding with the iPad, we had to customize products on the market that would allow for the flexibility needed in the field. Most of our workers became proficient on the device fairly quickly. As a result, it didn't take long before they greatly preferred the iPad to carrying around four sets of drawings all day.

Throughout this process, we found that the most effective way of getting people to catch on to this technology shift was by using word of mouth. Foremen and superintendents would talk to their coworkers about additional benefits that they were constantly discovering with this device. This was eventually considered much more effective than being instructed by company memo to adapt to a new tool, for example. We also soon discovered that our engineers were sharing their positive iPad experiences with their peers all across the country.

LESSONS LEARNED

Among the unanticipated benefits of going paperless was the discovery of issue-management software like Vela Systems. We found that Vela, which is designed specifically for mobile technology and management reporting, could be used across many other industry functions of the construction process to improve quality. We learned that these applications utilized the best features of the iPad, such as its multi-touch interface and its capacity to process and transmit information. This allowed architects and builders to bring hundreds of pages in an easy-to-read format that they could mark up, zoom in on and scroll through — saving time, effort and money. We considered this to be quite a bonus because our original goal was a paperless jobsite, and now we were finding efficiencies throughout the entire building process.

However, the process was not completely without learning opportunities. In retrospect, if we had worked with the architect at an even earlier stage in the planning process, the development could have gone more smoothly. Plus, it would have been easier for everyone if we had given the field crews more notice and time to adapt to the new devices. But once things settled down in terms of everyone getting used to using the device, it was great.

THE PAPERLESS FUTURE

Moving forward, we're working to incorporate 3D modeling and seamless updates into the system. Although tablet computers are not currently capable of Building Information Modeling (BIM) files, this is something we hope will be upgraded in the future. Plus, there is still a very small timing gap in the exchange of information, so things are not completely seamless just yet. Still, the new system has worked out great so far. And it's only going to get better!

All in all, the benefits of the paperless option far outweighed the drawbacks. Everything became quicker and more efficient, reducing the chances for error when updates were made. It really kept everyone on the same page. Saunders will certainly be incorporating the use of this technology into future projects, and other companies should follow suit if our industry is to evolve in the way it should. **edc**

GRAHAM CODDINGTON IS SENIOR PRECONSTRUCTION MANAGER AT SAUNDERS CONSTRUCTION.