

IF TIME IS MONEY, MIN



Component Assembly Systems' carpenters framed the new stadium that will be used by the Washington Nationals baseball team.

ED DATA IS GOLD

>>> BY STEVEN FERRY



Would It Help you to know if you were going to run out of drywall at 1 p.m. next Monday and that the whole project was lined up to complete at a loss in seven weeks' time? It could be done, theoretically, with smart use of computer programs and the Internet. There are many great commercial software programs available for subcontractors to manage their operations—the three key areas being estimating, accounting and project management—but most programs concentrate on just one functional area. Some extend beyond their core function to provide a broader solution, but very few cover all three of the main areas. →

THE KEY TO

a technology approach that would provide the theoretical ideal is to take the strengths of these programs and integrate them into one transparent system for dataflow and to provide real-time reporting. If yours is a large company with 20 or more active projects and a combined flow of more than \$100 million, you really need to know how you are doing at any time on the labor productivity, project and company levels.

One company, AWC member Component Assembly Systems, Inc. (CAS) of Pelham, N.Y., (www.componentassembly.com), has moved beyond the commercial, off-the-shelf universe to create its own solution to the technology quagmire with a system that has proven itself unequivocally to be the way construction will be managed in the future. **AWCI's Construction Dimensions** asked CAS if they would share their approach with the rest of the wall and ceiling industry. At first, they were hesitant, looking to protect their "proprietary" system. We reminded them that, as everyone in the industry knows, one's worst competitor is the company that underbids because they do not know their own costs. We prevailed upon CAS Director of Operations John Rapaport to give us a top-level view of how their system works.

It Started with a Snowstorm

CAS is a New York-based carpentry, drywall and ceiling contractor that has worked on many significant projects, starting with its first job on the World's Fair in New York City in 1964. The company has since built 50,000 hotel rooms, 4,000 hospital rooms and 30,000 apartment units around the country through its offices in New York, Boston, New Jersey, Washington, D.C., and Las Vegas, Nev.

The company's reputation for quality work delivered on-budget required a better computerized solution than was available in the industry in order to create the efficiencies, accuracy and speed needed to comfortably handle the larger projects it was being asked to service. The solution began to take form in 1996 when John Lord, CAS' vice president of information systems, was snowed in at home during a storm. He took his ideas to John Rapaport, who also happens to be general counsel for the company and son of the company's CEO and founder, Lew Rapaport.

The ideal they envisioned was that all their estimators, proj-

"CAS is a New York-based carpentry, drywall and ceiling contractor that has worked on many different segment projects, starting with its first job on the World's Fair in New York City in 1964.

The company has built 50,000 hotel rooms, 4,000 hospital rooms and 30,000 apartment units around the country."

"The ideal they envisioned was that all their estimators, project managers, executives, foremen, supervisors in the field, and purchasing and accounting staff would be on the same page, able to see the same information that related to their positions.

After a few interim steps and a large amount of work on underlying database management, the ideas began to take the form of a new software program."

ect managers, executives, foremen, supervisors in the field, and purchasing and accounting staff would be on the same page, able to see the same information that related to their positions. After a few interim steps and a large amount of work on underlying database management, the ideas began to take the form of a new software program.

Together with their small team, Rapaport and Lord continued to work in 2000 and by 2002 had developed their proprietary CASim (Component Assembly Systems Information Manager) system and the new standard operating procedures that it spawned. Now on their third version, they currently incorporate software from On Center Software (www.oncenter.com), digital imaging technology from Construction

ever software application the user needs to use is included seamlessly within the Web site, which includes 100 different screen designs to accommodate the different functions required to run the business.

CASim is internal, incorporating push technology with the use of e-mail and scanned images like extra work-tickets or material invoices. Beyond just CASim, the CAS IT team has all functions covered: downloading plans as TIFF-images (when the GC cooperates) and estimating remotely using employees in a South American offshore who take-off on the computer using virtual colored pencils (takeoff software by On Center Software). They use color plotters to print out the plans for final review. Compare this to printing plans on paper and sending large specification books and scope-of-work binders. Where the GC provides no FTP or disk source, CAS scans in all drawings (and any other documents). CASim also tracks payroll, codes and adjusts budgets, with the CF Data job cost-accounting software dumping the data overnight and adding new information into the system the following day.

The team asked for and received input from the users on what they would like to see on CASim, and how they'd prefer to see them on the various screens; the team turned over the requests to the programmer and so built an on-target and user-friendly series of screens that no off-the-shelf software could achieve.



The CASim welcome screen

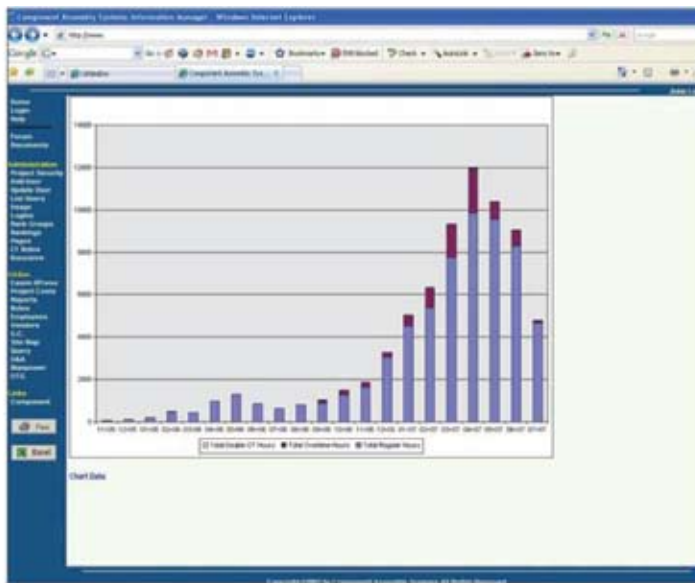
Imaging Systems (www.construction-imaging.com), as well as the job cost accounting software from CF Data Systems (www.cfdatasystems.com). In effect, the CAS team had finally harnessed the power of the computer and Internet to move current construction management practices to the next level and the 21st century. CASim, in recognition of this fact, was awarded a Gold Vision award by Constructech Magazine in 2006.

What Does CASim Software Offer?

CASim allows 150 users in the company's offices and field (anywhere in the world, even from an Internet café) to access the company information they are cleared to see through an intuitive (for anyone familiar with surfing the Internet) Web-based design with standard drill-down menus. What-

Equally important as facilitating the running of the entire business digitally online is that CASim allows management to see how operations are progressing and to take timely action when needed—and to set any anxiety to rest knowing that everything is under control. With databases of historical project information to draw upon after five years of using the system, CAS can often work faster and smarter than its competitors. As Art Doerner, the president of CAS, notes, "It's better than working off a napkin or writing on a piece of [wallboard]. The program flags problems and highlights trends we would have missed in the past."

Creating an efficient organization required the creation and updating of budgets and correct estimate data. Yet they had found much information wasn't making it from estimating to project management to the field and then back to ac-



CASim can show manpower loading by project (above) as well as an employee history screen (right)

CASim Employee Information

Employee no. M881 Union: NEW YORK CITY CARPENTERS UNION
 Name: [Redacted] Local: NY508J
 Address: [Redacted] Level: FOREMAN
 City, State Zip: [Redacted] Note Code: No Notes Found
 Phone: [Redacted]

Hire Date: 01/05/1987

YTD	Hours	Wages
Regular		
Overtime		
DoubleTime		
Other		
Total YTD		

Last Project Worked On: M881 15 CENTRAL PARK WEST Date: 07/17/2007
 Last Category: SUPERVISION-FOREMAN (5002) Last Phase: DIRECT LABOR-CARPENTRY (051)
 Rating: -

History on Project M881

Category	Phase	Hours	Rating
EXTRA-WORK	DRECT LABOR-CARPENTRY	32.00	
FRAME WALLS	FLOOR #1	4.00	
FRAME-TOP TRACK	FLOOR #1	4.00	
HOLIDAY	DRECT LABOR-CARPENTRY	76.00	
HYV GA FRAMING	FLOOR #1	12.00	
INSTALL FRC	FLOOR #1	16.00	
INSTALL SPECIALTY CEILING	FLOOR #1	0.00	
INSTALL-GWB TO P	FLOOR #1	16.00	
INSTALL WOOD BLOCKING	FLOOR #1	4.00	
LAYOUT-WALLS	CELLAR	81.00	
LAYOUT-WALLS	FLOOR #1	56.00	
SUPERVISION-FOREMAN	DRECT LABOR-CARPENTRY	1,061.00	
Total		1,504.00	

counting and estimating, closing the loop of information. So they linked estimating and other databases within their cost accounting data and insisted that the information input be accurate—all the fun-looking screens and best designs in the world having no value without core data being called in correctly and the estimating data being accurate and reliable.

“Here is just one example of information now being available between departments on an immediate basis: An estimator wanted to look at production rates on a hotel similar to the one he was bidding on, that CAS had built across town,” explains Rapaport. “He went into the CASim system, pulled up historical data, which included production rates, and was able to plug those into the estimate, thereby closing the loop on actuals feeding back future production analysis. With a more solid number quoted immediately, he was able to lock up the job.

“Construction often involves adjustments, rarely proceeding exactly as planned, so there have been numerous occasions to adjust our manpower in terms of numbers or skilled individuals. Now, if our production is not being met on certain jobs, we can see in real time if we need new framers, for instance, and adjust accordingly. Compare this to the usual practice of contractors putting people on the job and hoping the job comes out at the end. We are no longer working blindly, which is very valuable.”

“A quick case in point,” adds Lord, “is we built a multi-story hotel/casino in Atlantic City and by the fourth floor, we were seeing a general trend that would have hurt us on the project. As a result of our real-time systems kicking into place, we were able to see the problem, shake up the crews with the information we had and put the project back on budget. We think we’ve saved millions on these large projects.”

You Want Me to What?

Having a better mousetrap won’t necessarily see it used or accepted. As Lord puts it, “The construction industry generally has been slow to evolve with technology. So initially, our personnel was locked into the same old way of doing things. In some cases they were reluctant to adopt software that at first eliminated redundancies in a few of the departments—one person keeping a log that someone else in another department was also keeping—for fear that their jobs would be next. The way it played out, though, we found more needed to be done in our organization, not less, so we just re-tasked personnel. We kept plugging away until they saw the benefits and signed on. It didn’t hurt that John Rapoport’s father, Lew, was CEO, either, and John was able to persuade him to sign on based on the merits of the system.”

Now, as Lew sees it, “CASim works as a great instrument for management to have an immediate read on any job from New York to Las Vegas.” And it doesn’t hurt that a project manager today, whose training in CASim would be the most

extensive, takes only about an hour to come up to speed on how to use the system, and after a week of intensive use, questions that weren't addressed or may need to be read-dressed are cleared up.

Rapaport and Lord had to institute the system in small steps, starting with buying computers for all employees because many of them were not using them in 1996. Rapaport and Lord explained what today we know to be a no-brainer: that the Internet is a vital part of the vision. They held classes with outside instructors and conferences with project managers from the offices around the country, conferences with estimators and executive conferences—all to promote the idea of technology and of the system.

The IT team campaigned CASim within CAS, even buying T-shirts and mouse pads that proved popular. When CAS won the Gold Vision award in 2006, they had trophies made for each office because the employees had helped build the system with new screen ideas and other ideas over time. CASim achieved 100 percent buy-in, but as there is always the next new thing, such as how to track performance or rate differ-

ent values in the system, the employees still have something to say about these changes. This creates a challenge for the team, in addition to the way anything new interacts technically with the other systems; for example, the company is still trying to integrate Microsoft products and others within the system.

Want Some of the Same?

Any other company wanting to follow in CAS' steps—unless they beg, buy or borrow its software—will first need to pray as they set out, because a lot of faith went into CAS' designing of CASim. Bringing about the buy-in from the decision makers and then the rest of the company, organizing and integrating the databases for estimating and accounting and how they tracked their progress—these represented the heavy lifting. But the hardest part, apparently, was being able to envision the end result: for which they created a flow chart, showing where each click would go and what that screen's design would be—not something one normally does in a construction firm.

“With technology available today, however,” Rapaport says,

“CAS is working on a custom, handheld to link with the system, as well as some scheduling programs with potential to manage schedules on all the projects in real time; as well as through a group of project managers and other people to link the system for scheduling—a huge issue in the industry.”

"we're able to do things that we haven't been able to do before. If you can dream it, you can probably do it. But we were lucky. We were able to find the right people to help us, consultants, but mostly we did it ourselves. Consultants don't know your business like you do, so you have to be the primary driver and you might have to bring in people from outside the firm or maybe from existing construction software firms that might buy into the idea of even trying it. It's not cheap in terms of money and time—we've spent in the low six figures over two years on hardware, software, etc. But there are such huge benefits on the other side: We're doing projects now ranging up to \$60 million and \$70 million in size for one contract.

"We have 'kick-off' and 'status' meetings where we look at the information and adjust based on what the information is telling us—almost like a stock ticker showing in real time the changes occurring. Project managers and management see the information on a week-to-two-week basis as it takes that



Curved framing at the Washington Nationals stadium

long to derive a picture of what is happening on a project. On some large jobs you can even see a lot on a day-to-day basis.

"We could not track jobs with the level of detail necessary to identify production and productive employees, etc., or with total confidence in being able to run it, for a \$10 million or \$15 million job in 1996, let alone on some of our current \$60 million jobs. There was no transparency from the executive down to the field level to see how we were doing. Now we

have not just peace of mind but also accountability. Now we can move specialists into proper spots. In construction, there has always been some disconnect between what you do in the field and how the office perceives that, and CASim has helped us bridge this gap. Other companies might have some of this ability on paper ... we're not suggesting that nobody is doing any tracking—it's a matter of how you do it, what tools you use and how efficient you are.

"It's been interesting to see what happens in the field when they know they're included. It was a revolution in many ways to give the field staff access to the system. Most people would assume that carpenters might be not interested in using computers, but that is not the case. We are in a different time now, and we're inviting and really wanting their participation. We're seeing e-mails to the field now, and we're seeing use of on-screen take-off and other technology tools out in the field. And that is where the action is, that is where we win or lose mostly, and that's why we want to give them

the ability to participate, to see what is going on. I can't tell you how often they push their project managers to give them updated information in the system."

The Future for Everybody

CAS is working on a custom, handheld to link with the system, as well as some scheduling programs with potential to manage schedules on all the projects in real time; as well as through a group of project managers and other people to link to the system for scheduling—a huge issue in the industry.

"As a bigger player, we have to manage our risk, and we're doing that not only with technology, but also in the way we interact," Rapaport says. "So we're also looking at adding a VoIP (Voice Over Internet Protocol) telephone system and other technology. We're connect-

ing the dots with all the documents—the letters, faxes and other paper—as well as becoming involved with electronic purchasing. If suppliers want CAS to order their material for large projects, they might want to consider signing on to this whole concept. The company won't keep faxing and phoning in orders; those are just plain inefficient communication systems.

"We're respectful of our clients and want to be on top of the information to make the jobs run smoother and be the

reason for on-time completion. However, GCs are not unlike many participants in our industry, harboring fears about information sharing. For instance, it may be that we cannot regularly receive schedules or updated schedules on projects. Also, for instance, subs are interested in being paid; if they knew the GC had been paid, they would want their money pretty soon thereafter. So, there is inherently an issue of hiding the bacon a little bit and still a ways to go for buy-in. Right now, the basic information such as billing and change orders is being shared—and some GCs have plans on their FTP sites to download and vice versa. The issue is how much data sharing will go on to make a project more efficient between the participants and the stakeholders.

“GCs require a different setup than a specialty subcontractor. We’re managing resources, the manpower, physically building the project. Our message to them is while we might appear similar to another drywall sub, we’re adding value to the project because we’re watching our jobs in ways where we are able to adjust more quickly and bring the project back on track. It may be the reason we’re awarded many of the large projects. We have a bonding line up to \$500 million,

which for a drywall subcontractor is pretty unique. Our CASim initiative demonstrates that you can share information and be better off than if you didn’t share it—we’re all more powerful and successful because of it. We are working on initiatives that can link our schedule to a GC’s electronically, if they let us. We have built CASim to leverage XML (Extensible Markup Language) initiatives too.

“We work alongside the electrical, HVAC, plumber and other sub trades, many of which have been taking a long time to climb on board and make themselves more advanced—yet many times we’re only as good as the other trades on the job. If the plumber is held up, we’re held up; if the electrician is held up, we’re held up. So what I would like to see is the subcontracting community supporting technology initiatives to make subcontracting as advanced as possible.

“There are still decent-size companies working the way they did 20 years ago, and that really hurts everybody. For ideas on how to begin the re-engineering process, smaller contractors reading this article can contact me at jrap@component-assembly.com or (914) 738.5400. We weren’t such a big

“GCs require a different setup than a specialty subcontractor. We’re managing resources, the manpower, physically building the project. Our message to them is while we might appear similar to another drywall sub, we’re adding value to the project because we’re watching our jobs in ways where we are able to adjust more quickly and bring the project back on track.”

contractor 15 years ago. We looked at how we estimated, all of our work processes and flow, every paper form and input electronically; who passed what piece of paper to whom. This took years to figure out, what was really happening and how we could improve the processes. We’re still doing it. Contractors can do the same. CASim is the central place, but without being able to estimate a certain way, we can’t send out more bids onto the street and land more projects. So the first thing to look at is estimating: we didn’t really do much on CASim until we had changed our estimating practices. Smaller contractors have fewer layers of management in most cases, so they can probably move quicker and have an easier time than larger companies. It’s much easier to scale up, as they grow, if that is what they want to do.”

Right now, CAS is able to see the consolidated position of all projects at any given time with the click of the mouse. Many contractors in different trades have to wait until the end of the job to see how they did, which is pretty nerve-wracking when the odds are it won’t be such good news. By that time, they have no leverage, they’re finishing or not on the job site

anymore, and there’s no time to adjust. Whereas at 5, 10, 15 percent of the project, CAS is looking to adjust in order to keep the job on course and the clients happy by adding value. As John Marone, senior vice president of CAS, states, “It hasn’t made our work in the field physically any easier, it’s just made us work smarter and more efficiently.”

“We’re designing new screens every week,” Lord says. “The sky’s the limit. We can see the day when we will have the system on handheld devices so everyone will be a part of the system, organically attached, inputting and extracting data in real time, and we’ll be able to carve up that data into many dimensions.”

Knowing you will run out of drywall by 3 p.m. on Monday and having the ability to adjust manpower on an hourly or daily basis and focus the skills where they are needed, has CAS looking at “gold in them thar projects.”

About the Author

Steven Ferry is a free-lance writer in Clearwater, Fla.