

# JOBSITE SITUATION AWARENESS

By Wes Hoffman

**S**ituation awareness (SA) is defined as identifying, processing, and comprehending the critical elements of a complex situation in real time and understanding the appropriate course of action to take. A more simple definition is “knowing what is going on so you can figure out what to do.” Complete, accurate, up-to-date SA is considered necessary in any field where the effects of increasing technological and situational complexity on the human decision maker are a concern.

SA is recognized as a foundation for successful decision making across a broad range of disciplines—including aviation, air traffic control, and emergency response—and is also applicable to modern construction. Having situation awareness is vital to the successful supervision and execution of any construction project. With the introduction of design/build, compressed schedules, and tighter budgets, getting real-time access to the critical components of a project’s status is more essential than ever. New trends are emerging that offer ways to gain better situational awareness by incorporating the latest Internet communication, collaboration, and monitoring technology.

Internet and wireless technology have fundamentally changed lives and remade many industry sectors. Some areas have proven more difficult to reach with IT, and certainly the building and construction industry is one. This enormous industry is structured around countless remote projects in which the vast majority of work is done by small subcontractors with little to no IT budget or background. Left to fend for themselves, many small to medium-size contractors have simply dismissed the opportunities to take advantage of these advances in technology. Conscious of this problem, construction technology companies have introduced easy and cost-effective solutions that any size company can use to gain situation awareness.

## INTERNET COLLABORATION SITES

Pioneered by companies like MySpace and Facebook, communication and collaboration over the Internet have evolved into much more than e-mails and Web sites. Individuals now have their own personal Web pages where they keep family and friends up to date with daily blogs, instant messaging, Web cams, pictures, and audio. These personal Web pages are easy to configure, and content can be added or removed with the click of a mouse. As these sites interconnect, networks of communities develop and information is shared at a rate unimaginable only a few years ago.

This type of high-bandwidth communication is now being made available to the construction business through industry-specific, Web-based project management sites. A Web site template is created for each construction project, and members are invited to participate. As the project evolves, the Web site grows and

becomes a single source for all project information. Most of these new Web-based services charge a relatively small monthly fee, either per user or per project site. Internet collaboration sites offer many advantages over traditional e-mail, including the following:

- Shared status and schedules allow every member of a construction project to stay current with the latest project information.
- Document storage and retrieval for plans and specifications are available. Most sites also offer revision history and work-flow control to speed up approval processes from weeks to hours.
- The sites offer customizable bid, submittal, and request for information (RFI) systems that include automatic e-mail alerts when new items are posted and are in need of an individual’s attention.
- Project discussion boards, daily logs, and action items track specific tasks and maintain both a timeline and a record of communication.
- Multilevel security controls restrict the information each site member can view and/or edit within the project site.

## GPS TRACKING

The global positioning system (GPS) was first made available for public use in 1983, and since then many commercial products have been introduced. In recent years, the cost of devices that use this system has dropped substantially, creating an explosion in tracking applications. Most recently, low-cost personal GPS trackers have hit the market so parents can track children, fleets can track vehicles, and companies can track employees.

In the construction industry, time is money, so knowing how workers are spending their time is critical to staying competitive. GPS tracking systems that let supervisors know where their workers are and what they are doing are now available. These systems use either GPS-enabled phones or custom hardware to track workers’ locations, and they use geo-fences to define jobsites. The exact times workers enter and exit a jobsite are transmitted to a central server that logs their hours. Workers’ locations can also be viewed in real time via an Internet application. Key benefits of electronic labor tracking include the following:

- Automatic labor reporting eliminates overbilling.
- No time clocks or handwritten timesheets are required, and labor reports are generated automatically.
- Resource management, productivity, and supervision are improved.
- Employers can track job completion and simplify general contractor labor review.

ABOUT the AUTHOR



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### WEB CAMERAS

Construction cameras are becoming common on jobsites for both remote monitoring and security. Previous camera systems required a fixed location, electrical cables, and an Internet connection or tape recorder, making them impractical for many situations. The latest innovation in construction camera technology is self-contained, mobile, solar-powered, wireless Web cameras that can be moved quickly and do not require any external connections. These trailer-mounted cameras are usually attached to a telescoping or collapsible tower and can be controlled and viewed via the Internet.

A number of companies lease their cameras on a monthly basis, making them affordable for both large and small projects. Construction Web cameras provide the following advantages:

- Remote jobsite monitoring and control can be performed from any computer or PDA.
- Motion detection, patrol modes, and night vision increase security and reduce theft.
- The ability to record and play back time-lapse images allows users to track project status.
- Many insurance companies offer a discount for projects with cameras.
- Video feeds can be integrated into Web-based project management sites.

### CASE STUDY AND COST SAVINGS

Brad Cook, founder and CEO of Cook Concrete, had a problem. His Dallas-based concrete, utility, and excavation company was growing too fast, and he needed to find a way to supervise his projects more effectively. Faced with having to turn down business, he looked to technology to help him manage growth and increase profits.

Cook says, "Automating labor reporting, leasing cameras, and using Web-based project management is probably the best investment we've made in years. We're able to work more efficiently on more projects, creating new growth, better margins, and satisfied customers. Our supervisors, general contractors, developers, and vendors are communicating more efficiently, and they're able to easily get the information they need when they need it."

Cook adds, "Now, rather than make 20 phone calls and send 20 e-mails to stay informed, I have a complete picture of all

my projects. I get a project's current status in real time directly from my computer."

Cook is also pleased with the cost savings he has seen. "The investment in these new technologies has more than paid for itself," he notes. "When we deployed a GPS labor tracking system, our payroll costs dropped almost 10 percent, the insurance discount we get for using cameras

pays their monthly lease, jobsite theft is down, and productivity has gone up."

By utilizing low-cost technology to improve situation awareness, Cook estimates his company will save more than \$500,000 this year alone. For construction companies looking to reduce costs and increase profits, it is definitely well worth it to consider investing in technology. ♦



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