



The Internet Today

WHAT'S IN IT FOR PAINTING CONTRACTORS?

*by Robert Ikenberry,
California Engineering Contractors*

Maybe I was an odd child, but one of my childhood fantasies, you know—what I'll do when I'm rich and famous—was to have a private librarian. He was my reference source. He could look up any fact, define any word, show me any picture, describe any place, just at my whim. He was sort of an information genie in a bottle and I had an unlimited number of wishes. Well, I never got rich or famous, but I got my fantasy—it's the Internet.

With a reasonable amount of effort and skill, you, a search engine, and an Internet connection can do all of the above, and more. Some of the things I never even fantasized about include buying and downloading the text of a needed test method at 3 a.m. on Saturday; making airline reservations and ticketing them at noon on Sunday for a flight on Monday morning at 6:30 a.m.; and the most powerful feature of the Internet, two-way communication. The Internet provides the ability to send instructions to your foreman on Sunday afternoon and know that he'll have the new specifications and a schematic of the proper hookup for the equipment that ar-

rives Monday at 8:00 a.m., even though you're on a plane. Most of us are passive Internet users. It's wonderful to get a copy of the data sheet on that new abrasive from Australia, but the real power of this medium is that it goes both ways—you can also send photos of your most recent project to a potential new customer all over a simple Internet connection.

I'm not going into any detail about browsers, ISPs, modems, and DSL. This article isn't about getting connected to the Internet. It's about what you can do once you get there. I will assume that you have a personal computer with an Internet connection (at least a dial-up modem), a browser (the program that lets you see Worldwide Web pages), and the ability to send and receive e-mail with attachments (often part of your Internet connection and browser, but could be a separate service). Also, please note that the examples of web sites in this article are intended only to be illustrative. They are not intended to endorse any particular company or site or to indicate that the examples shown are the best. Ex-

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periment, go exploring on your own. The links listed here are just a jumping off point. The best is out there and growing and improving every day.

If you need more information about getting connected, talk to friends, neighbors, and your kids, or look in the local library or bookstore. The Internet is a moving target. It's changing the way we

live and do business like no other single development in our lifetimes. There is only one thing I can say about the Internet with complete certainty. This article will be obsolete by the time you read it. If you really want to know the state of the art, you'll have to check for yourself today. Because what was current yesterday is old news today.

INFORMATION

OK, where do I start? The greatest resource on the Internet is information. All users of protective coatings—owners, specifiers, contractors, and suppliers—can find the Internet to be a valuable source of information. Get familiar with the use of a search engine (or several) and go exploring. You will find access to products, services, material safety data sheets (MSDS), application instructions, regulations, and more.

SAVE LINKS

Start a library of sites that are of interest to you. Some sites such as bid listings or periodicals will be locations you will want to return to regularly. Some sites such as a manufacturer's web site will be handy to return to for product data or the latest safety information. You can organize and save the addresses of pages (called URLs) in a list within your browser. Netscape calls them "bookmarks"; Internet Explorer calls them "favorites." In any event, they are remembered links to Worldwide Web pages and will take you directly back to a site you visited before, simply with a click of your mouse. The attached listing shows several sites of general interest to painting contractors. I will apologize in advance as some of these site addresses will have been changed. The Internet really is a moving target. Use care when typing. A period instead of a comma or a dash rather than an underscore will cause your request to fail. In some instances, portions of addresses may be case sensitive.

Search engines vary in coverage and approach, so check out several. I find AltaVista (www.altavista.com) to consistently locate the types of sites I'm most often looking for. Generally, the problem with searches is too much information. You'll get what you need faster if you know the exact term you are searching for (enclose multiple words in quotes). "Single component urethane" found 37 web pages; "ure-

thane” by itself returned 54,375 sites. If your search returned more than a few hundred hits, it may be very difficult to sort through them. You can make a search more specific by adding related words: “urethane + topcoat” gave 72 referrals. For an alternate search site, try www.google.com. Some search engines use multiple approaches incorporating several sub-searches like www.ask.com.

A related search feature is access to on-line yellow pages. You can look up any business and get its address, phone number, a map to its office, and a link to its web site if it has one. The “white pages” version of this search capability will allow you to find names, addresses, and phone numbers for individuals. Check and see if you or your business is listed—the results may surprise you. By using Yahoo yellow pages (www.yip.yahoo.com) or similar sites, I have been able to eliminate several feet of paper phone directories (always outdated) from my bookshelf in my office. For individual directories, try www.uswestdex.com, peoplefinder.excite.com, or others.

USE THE WEB TO HELP YOU GET AROUND

For those of us who travel for work, three Internet offerings are particularly useful: reservations, maps, and aerial photos.

Reservations

Airline reservations (and car rentals or hotel rooms) are available from web sites provided by the individual airlines (United is at www.ual.com, Southwest at www.iflyswa.com, just as a couple of examples) or through on-line travel agents such as [travelocity](http://travelocity.com) (www.travelocity.com) or Microsoft’s [Expedia Travel](http://Expedia.com) (www.expedia.com). Either type of site will offer fast, cost-effective (if you are careful) reservations and ticket your flight with a credit card. One word of caution: You won’t have a travel agent double-checking your flight dates or checking the fares for the best rates. Check more

than one site for the first few times until you are confident you are seeing the most competitive fares and double-check the dates before you press “SEND.” Electronic or e-tickets don’t get lost and have worked well for me. Rental cars and hotel rooms can also be handled over the Internet. If you have special travel interests or want to mix business with pleasure, the Internet can show you the sights to see in your destination city or can hook you up with a quaint country inn or bed and breakfast, if that’s more to your liking.

Some sites (www.priceline.com, for example) offer reverse auctions where you propose a price you are willing to pay for a flight or hotel and see if anyone agrees to provide a seat or room at your price. This type of transaction works best when your travel plans are flexible, but savings can be significant if the airlines are trying to fill a seat at the last minute on a flight to a less than popular location, and it doesn’t cost anything (except your time) to make the offer.

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WHAT ONE INDUSTRY REPRESENTATIVE IS DOING

by Robert Ikenberry, California Engineering Contractors

Ted Moore, the Industrial Sales Representative for Sherwin-Williams in the San Francisco Bay Area, says he uses the Internet and Worldwide Web almost every day. E-mail is his most frequent use. “It’s ideal for long-range job communication, especially when spanning multiple time zones. Coordinating home office technical inquiries and job site contacts in Guam would be very difficult by phone. With e-mail, it works smoothly. E-mail also lets me group broadcast information to SSPC standing committees or to all our regional sales managers. E-mail helps cross divisional lines and keep all interested parties abreast of developments.”

Ted says he uses the Internet to find technical data and published information while researching competitors’ products. He also uses it to follow public agency jobs for specifications, bid dates, and award notices. This information helps him be more valuable to his clients and to spend his time more productively.

For the future, Ted sees more use of

high tech tools. “Successful industry professionals are going to have to be self-motivated and adopt the use of these tools. Just like faxes and cell phones in the past, the Internet will be one tool we can’t live without in the future. Industry management needs to recognize the value of the Internet as an internal tool, especially for distributed operations. They should push computer knowledge and skills down to the lowest levels. Field people without Internet skills and access will limit the ability of companies to compete.”

Benefits for Ted include timeliness and responsiveness. “I threw out all my paper MSDSs. They were always obsolete. The postings on the Internet are quick and always current. The bottom line is to cultivate business. I use the Internet and technology tools because they make me more productive. Customers are smart. They will usually use the quickest, easiest way. If I’m more connected, more accessible, the easy way will be to go through me.”

Maps

Once you get to your travel destination, a map of the local area or job site vicinity can be invaluable. Again, the Internet is a useful tool. Several sites offer maps (www.mapquest.com; www.aaa.com). Some even offer detailed driving directions based on the fastest, shortest, or most scenic routes, and they tie in sights and services like hotels and restaurants along the way. Some search engines' yellow pages, such as Yahoo!, will not only find the phone number and address of a supplier but will also print you a map or give directions right to the company's door. The maps provided with search engines or yellow pages tend to be fairly small and not too detailed. If you want detailed maps from the Internet, one useful site is www.delorme.com/cybermaps. Its strip maps will show a clear route from your starting point to your destination. For another type of map, many of the U.S. Geological Service topographical maps are available for free. Web sites are trying hard to get your attention

these days. Several services will offer a combination of features like reservations, maps, search features, and links to related sites.



**A GLOSSARY OF SOME
INTERNET TERMS
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Aerial Photos

Have you ever wanted to see what the area around a job site looked like before you arrived? The Internet now offers a unique and fascinating feature: on-line high-resolution satellite and aerial photos. One site, www.teraserver.com, offers a database of free digitized aerial images down to a resolution of one meter (individual houses and even cars are visible). These images can help provide an overview of the area surrounding a bridge, tank, or new construction site to locate the nearest neighbors. They can also help you locate adjacent vacant property for a marshaling yard or alternate access routes. A good photo could even save the need for a trip or help you become familiar with the area even before you arrive.

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SITES SPECIFICALLY FOR THE PAINTING INDUSTRY

Associations and Journals

Several sites (and sure to be more soon) cater to the painting industry, although industrial protective coatings have not been the focus of as much attention as many consumer-oriented activities and interests. At www.sspc.org, you can have direct access to SSPC specifications, which can be purchased on-line; lists of contractors certified to SSPC-QP 1, QP 2, and QP 3; and other valuable information. SSPC also offers a comprehensive listing of links to industry organizations as well as state and federal regulatory agency sites. The site, www.corrosion.com, has information for the protective coatings and linings industry and links to several manufacturers.

NACE International (www.nace.org) has a complete listing of certified inspectors on-line as well as specifications and standards that can be purchased. The American Society of Testing and Materials (ASTM) also sells standards on-line at its site, www.astm.org.

PaintSquare (www.paintsquare.com) is the new website of *JPCL* and its European counterpart *PCE*. Designed to be a cockpit from which contractors can conduct their work, PaintSquare has launched 7 of 15 planned components.

These include an auction for sale of excess paint and used equipment; buying guides listing and describing 4,000 companies; a searchable library containing back issues of *JPCL* and *PCE*; daily news about the coatings industry; a career center where employers can post job openings and job seekers can post resumes; vendor storefronts where users can acquire data, case histories, and sources of products and equipment; and a procurement hotline, where buyers can post and automatically e-mail a description of their needs to appropriate vendors.

The Painting and Decorating Contractors of America (PDCA) has a “virtual” paint store at www.paintstore.com with an on-line version of the magazine, *Painting and Wallcovering Contractor (PWC)*.

There are many other kinds of sites for the paint industry. Several are described below.

Paint Manufacturers

For contractors, one of the most helpful features of the Internet is instant access to product data sheets, application instructions, and safety information. In just the past couple of years, the number of manufacturers offering on-line catalogs, product data sheets, and material safety data sheets (MSDS) has grown significantly. Chances are now good that you can find the information you need to estimate quantities, select equipment, and plan safety needs with data available from manufacturers over the Internet.

Material safety data sheets are required for all hazardous materials—not just the paint—at your office, shop, and job site. These necessary safety forms can often be down-

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- **Application service provider (ASP):** A company that provides the equivalent of a computer program (like a word processing program) but keeps all the software at its location rather than on your computer. The company “hosts” the application and you use it through an Internet connection to the company’s computer.
- **Attachments:** Files or data sent with an e-mail. Attachments can be texts, documents, photos, spreadsheets, or any other kind of digital data. The party on the other end will need a suitable program to view the file.
- **Authorized users:** Parties or participants who can read (view), write (change), send, and receive information on an extranet, depending on what rights the administrator has granted.
- **Bandwidth:** The speed (typically in bits per second [bps]) at which you communicate with the Internet. Bandwidth varies from slow (28.8K bps to 56K bps—typical dial-up), to moderate (384K bps—typical DSL), to fast (1.5M bps or more—high speed DSL, cable, or T1).
- **Dial-up modem:** A connection to the Internet that uses a device in your computer to dial an ISP on your phone line and convert the analog phone signal to digital data (modem = MOdulator-DEModulator).

Glossary of Some Internet Terms

- **Download:** The ability to send a copy of a file or set of information from some other location to your local computer is known as “downloading.” Sending a file or information to a remote location or computer is called “uploading.”
- **File transfer protocol (FTP):** A standard the Internet uses to “upload” files from your computer to a host computer. To “post” your web pages, you will typically need to send them to your ISP using FTP.
- **Hosted Internet site:** In this article, an Internet site (really an extranet) where the information provided is presented in a web-page based interface that the host company provides. You don’t have to write any HTML code—it’s automatically translated for you.
- **Hypertext mark-up language (HTML):** The “programming language,” similar to BASIC or C-PLUS, that tells how to display a web page.
- **Internet:** The collection of computers, information, web pages, and data services that share a communication standard (language) known as Internet protocol. The Internet was originally a private network of government and university computers that has been expanded to allow access to the information by everyone.
- **Internet connection:** Your electronic link to the Internet, generally established through an ISP (Internet service provider), of which AOL and MSN are two of the largest. Your connection can be made through a typical voice-type phone line (a 56K dial-up), your cable connection, a satellite dish, or a high-speed dedicated phone line like a ISDN, DSL, or T1 line.
- **Internet service provider (ISP):** See “Internet connection”—the entity that provides you with access to the Internet is your Internet service provider.
- **JPEG:** A type of compression for electronic photo files. Specifically, it greatly compresses digital still image (picture) files with little degradation of the image. Typical JPEG files are $\frac{1}{40}$ th the size of an uncompressed image (or even smaller). TIFF and BMP files are uncompressed.
- **Links:** Specific Internet addresses or URLs (uniform resource locators) established to allow an Internet user to proceed to a previously set-up or saved location without re-typing the entire address. Links are often embedded in web pages to send you to a new location. They can be used to define terms, expand information, or provide other supplementary information.
- **Pixels:** Picture elements—the colored “dots” that make up the image in a digital photograph.
- **Project collaboration/extranets:** The Internet is everything “out there” to which the public has access. An intranet is typically a network that is for your company alone. An extranet is something in-between. You (or the system administrator) select who gets to see and use what information or services, but the entire system operates over the Internet and among several entities. Project collaboration uses this selective access (i.e., security) to allow the participants on a construction project to have access and input to the portions they deal with on a “need to know” basis. Project collaboration lets everyone participate, but with controls and checks and balances that are typically not present on regular web pages.
- **Search engine:** Software that scans all (or at least many) of the web pages posted to the Internet and indexes and organizes the content so that users can find what they are looking for. Currently, search engines are mostly limited to text searches; sound and image search engines are tougher, but are being developed.
- **Shell program:** A supplementary computer program (more than just your normal web browser) that is necessary to see and use the information and tools provided by the extranet or project collaboration system.
- **User interface:** How you view and interact with the information—the “look and feel” of your interaction with the program and the information.
- **Worldwide Web:** The part of the Internet that uses a special computer language, HTML, to create and view text and graphics that appear basically the same on any type of computer with any type of connection. The web is typically organized by “web pages” or screens of information on your computer. Your “web browser” translates the HTML to the pages you see on your screen.

loaded from the manufacturer's or supplier's web site. MSDSs for generic fuels and lubricants are often posted on oil company or jobbers' sites. MSDSs for common chemicals and solvents like methyl ethyl ketone (MEK) are located in the MSDS libraries of several universities and major laboratory supply houses.

OTHER SAFETY RESOURCES ON THE NET

Many other safety resources are available on the net as well. The single best location for OSHA regulations is the agency's web site, www.osha.gov. There you will find current and proposed safety regulations, compliance guides for small businesses, model safety subjects for detailed programs like respiratory protection, and a database of inspections and citations issued. Most state OSHA plans have their general industry and construction safety orders posted on their own web sites as well.

There are training programs available on the web, both for sale (typically offered by private training firms) and free (often offered by industry advocacy organizations). If you need to put together a compliant forklift training program for your firm, first check the current regulations and comments at OSHA and then go searching for "forklift training" information that will help you put your own program together.

JOB LEADS AND BIDDING INFORMATION

For contractors targeting state and federal government work, the Internet is fast becoming an invaluable resource. It is the "publication" of choice for most government agencies. Not only are upcoming projects listed for most agencies, but also, some are posting specifications, drawings, and site photographs.

For upcoming state department of transportation (DOT) projects, refer to the site <http://www.mdot.state.mi.us/otherdot.htm> for a listing of all the

DOT web sites. The site is offered as a courtesy of the state of Michigan.

Navigating the maze of government web sites can be a real struggle. If you have an agency that you work with regularly, such as the Army Corps of Engineers, contact the local office and ask where the upcoming projects for bid or requests for proposal are posted. Use

your search engines to look for the type of agency's work that interests you. The federal government has a search location, www.thomas.gov, to help navigate the halls of the federal bureaucracies. The *Commerce Business Daily (CBD)* is posted on the web in several formats and versions, some at minimal or no

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charge. The *CBD* is a comprehensive listing of almost all the public procurement activities of the federal government.

The web can even keep you up-to-date on international contracting. For example, Canada has Internet postings of provincial and federal government contracts.

For private work, several sites are trying to become construction portals that will organize the construction information you want to see, including job leads. Some of these are project collaboration sites discussed below. Some are focused exclusively on procurement and business-to-business (B2B) interaction without any project management features. Most of these sites are struggling to organize the vast number of suppliers and subcontractors that participate in construction. Many are starting with a focus on commercial projects and Construction Specification Institute (CSI) divisions. This approach may not work well for industrial protective coatings. For an example, check out www.buildpoint.com.

Caution: Searching for job leads on the Internet requires patience. No single address will point you to where you need to go. Many links will be obsolete or contain errors that send you in the wrong direction. If you think a link should work, try fixing it yourself by entering a corrected address—typos abound on the web. If a link tries to send you to www.hello.con, it almost certainly really means www.hello.com. Don't hesitate to jump in and use your best judgment to supplement what you find.

COMMUNICATION WITH OTHERS

The first, and arguably easiest, two-way Internet communication for most of us is e-mail. Unless you are really in the dark ages, you or someone in your family has access to e-mail.

E-mail is a feature of the Internet that every business person should use. In addition to the e-mail account that most service providers offer with access to the Internet, several sources of free e-mail are available. All you need is an Internet connection and you can

check your e-mail. Instant (or at least rapid) transfer of printed information has progressed from telegram to telex to facsimile to e-mail. Faxes revolutionized the transfer of printed information in the late 70s and 80s. E-mail is the communication revolution of the 90s and the 21st century.

ATTACHMENTS, PHOTOS

In addition to instant transfer of text, e-mail can send digital photos and documents as attachments. Pictures can convey much more information with less effort and can be a real time saver. When taken with a digital camera, photos can be sent with a few mouse clicks. Some cameras are ideal for e-mail because they save directly to floppy disks and automatically compress pictures using the popular JPEG file compression format. Be aware of the image size and format of your photos. The latest versions of digital cameras can take very accurate images with up to 3 million pixels (picture elements). These files can be very large and slow to transfer. They can even cause the e-mail transmission to fail. Several systems have limits on the size of e-mail messages that can be sent. Most can handle a file of one megabyte or less. Larger files can cause problems. Since browsers use the same resolution to display all images, very detailed pictures will be so large on the screen that it may be impossible to get a good view of the whole image or to print out the photo. When sending e-mail photos, a minimum size of 240 x 320 pixels will often get the message across; 640 x 480 pixels is a good standard image size. Avoid sending images larger than 800 x 600 pixels unless you know the party on the other end is prepared to deal with large files.

Files other than photos can be sent with e-mail too. A copy of a letter, a specification, an AutoCad drawing, and even a fax received on your computer can be forwarded to another computer. Anyone with the proper software can read the image or open

the file. It might sound like you could do most of your correspondence and project communication on the computer with e-mail. Well, you can. But there is also a better way, as we'll see.

ADVANCED USES

Remember at the beginning when I said the Internet is most powerful when it is

interactive? When communication goes both ways? Well, e-mail is just one form of two-way communication.

Your Own Web Site

You can also build your own web site. There are several ways to get started on the Internet as a "content
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provider.” First, you can look to one of several sites that will host your web pages for free. They will typically put a small ad banner at the top or bottom of your page, but it really is a way to get “published” at no cost. Sites like GeoCities (now part of Yahoo!), Homestead (www.homestead.com), and NBCi (www.nbc.com/mywebsite/)

will provide space for your painting tips page, even help you create it with walk-through step-by-step templates. Your Internet service provider (ISP) may make space available on its server for your site. You will probably have to learn a little HTML or get a web page publishing program like Front Page to create your site from

scratch. Uploading the information to the server is usually accomplished with a utility provided by the ISP, or you can use a standard protocol like FTP. Don’t let the acronyms intimidate you. It’s really not that tough. Or there is sure to be a local web site designer who can get you into the digital age for a reasonable fee.

If you don’t think your web design is really ready for prime time, but you want to have corporate information like safety programs and standard forms available all the time, you can just save copies of the files on your web site, either in their native format (they will have to be downloaded for use locally) or converted to HTML (which can be printed directly from the web). Don’t post anything you don’t want to be in the public domain. You may not have published the site address, but anyone who finds it can download or view the information you post, including competitors and clients as well as employees. If you want to post information but also control who has access, you may want to consider creating a project collaboration site, or project extranet.

Project Collaboration Sites/Extranets

The latest development in Internet tools for construction and contractors focuses around two distinct but inter-related concepts: Project Collaboration (web sites that foster communication and project management on-line) and e-commerce (through digital communities of specifiers, buyers, and sellers with the goal of developing viable construction e-commerce).

Companies like Buzzsaw and Constructware are attempting to change the way construction companies manage their projects. By hosting secure project web sites, these ASPs (application service providers) offer a database structure and the tools to control and share all the information necessary to manage a construction project.

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How Project Collaboration Sites and Extranets Came About

Several major engineering contractors recognized that the need to have updated information on complex projects with many participants was awkward, complex, and costly. The complexity of the projects was causing constant delays, mistakes, and large bills for printing drawings and other documents and for delivering them all over the country (or the world!). Experts estimated that up to 10 or even 25% of the cost of a complex project was wasted effort or inefficiency related to this communication expense and the costs that confusion, delays, and mistakes caused. Even if only a small part of this cost could be avoided, the potential savings to the owner and/or profits to the contractor would be staggering.

Variouly called project collaboration, project hosting, project extranets, or web-enabled project management, whatever the term, the concepts are similar. Post all the project-related information, drawings, schedules, specifications, RFIs (requests for information), correspondence, and reports at a single site; control who has access to the information on a need-to-know basis; and always keep it up-to-date. Variations abound. In its simplest form, the ASP simply provides a space for the contractor's information and acts as a gatekeeper, providing access, security, and back-up. It's up to the contractor to put in all the organizational structure as well as content. Buzzsaw.com is currently closest to this bare bones concept but as this article is being written, it is changing from a primarily free service to a more conventional pay-for-service model and presumably will be offering a more complete set of tools for the project manager.

Benefits

The primary benefit foreseen by the advocates of project collaboration is better communication. Using the web site and e-mail, authorized users have

access to the latest specifications, drawings, schedules, meeting notes, and correspondence. RFIs are immediately routed to all the parties involved, and project managers can track who has received what, who has read (or at least opened) a document, and who has taken action to respond. Delays in information flow can be eas-

ily tracked and documented. There is no waiting for printing, addressing, mailing, transit, or delivery. Digital notes can be attached to photos or drawings and information sent back and forth in a flash. Time zones are no barrier; in fact, there are some extra efficiencies to be gained working

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with engineers or designers in Europe or Asia. They have all (your) night to work on your questions. Answers can be waiting for you when you arrive at work the next day.

Pitfalls and Downsides

First, to take any advantage of the benefits of web-based project management, you need a connection to the Internet for each participant at every location. This may not be a problem for your home office, but it can cause considerable expense and difficulty in remote, mobile, or field construction locations. As wireless and satellite connections become more available and affordable, connections in the field will become less of a hurdle.

Bandwidth is another potential pitfall. A 56k dial-up modem is fine for straight e-mails and documents but for feature-rich extranets, complex CAD drawings, and especially digital photos or extensive graphics, a dial-up can be painfully slow. The access to current information on your entire project is of no value if it takes forever to transfer to you. Frustration with waiting for information to download tends to grow as one becomes more familiar with and dependent on technology. Lack of patience can be a killer if it causes your field crews to try to “go around” the web project management rather than use it.

Paper copies may not be equivalent to screen copies. Especially with large format construction drawings, the screen-based versions are not nearly as easy to read or use. It may still be necessary to print out most drawings. Then, the struggles with ensuring your copy is most current begin all over again.

For an overview of the current state-of-the-art, here are three examples of project management offerings over the Internet. This is not an extensive sampling but is intended to be representative. For a more exhaustive analysis and listing of all services available,

check out Extranet World at www.extranets.cc and pull up the latest copy of "THE LIST."

Citadon

Two major extranets recently merged. Bidcom and Cephren are now Citadon (www.citadon.com). Cephren was one of the first full-featured project collaboration providers. Its services were developed with assistance from large, sophisticated engineering contractors and used by large general contractors. Its main service, ProjectNet, is designed to handle construction jobs of any size. Since ProjectNet and several other services are marketed on a per project basis, they tend to be most cost effective for large projects with many participants. Contractors with several concurrent mid-size projects may find the service expensive. ProjectNet provides sophisticated security features and tools to track documents and view over 200 types of file formats.

Formed through the earlier merger of Blueline-online (the project collaboration side) and e-Bricks (the B2B procurement side), Cephren was one of the first to offer full-service project management (ProjectNet) and construction procurement/bidding (MarketNet). Citadon hopes to have its established customer base of general contractors and owners help bring in and select the subcontractors and suppliers for the first phase of on-line contract purchasing. Cephren plans a regional, phased-in rollout of its MarketNet service.

Bidcom, the other merger partner in Citadon, was another of the early, successful full-featured project collaboration service providers. Initially, it took a little different tack, focusing its sales efforts on owners, architects, and developers. Now, as a part of Citadon, it is also concentrating on large general contractors.

Through several recent alliances, acquisitions, and expansions of its services, including the merger with Bid-

com, Citadon seems to currently offer an extremely wide range of services. Its Basic Collaboration Services (ProjectNet LT) was being offered as a more cost-effective, easier-to-learn system. The full-service ProjectNet Docs ties in with MarketNet bidding services (for subcontractors and major suppliers) and listings through *Con-*

struction Market Data (CMD). It will even set you up with a computer and Internet connection through its partner Everdream. Citadon stresses that it wants to serve the entire building cycle, from concept through design, building, and even maintenance and operation of the completed structure.

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Constructware

Constructware (www.constructware.com) is a very “contractor friendly” project collaboration site. It has a full range of project management tools including special time savers like accident reporting and incident investigation forms. Constructware is one of the few major players that was developed by a contractor (in this case, a painting contractor). It first developed a subcontractor stand-alone project management tool (which is still available for purchase if you don’t need to share information outside your organization) and has since developed that software into a hosted Internet ASP. One of the unique features of Constructware is that its database spans multiple projects. With one log-on you can see what’s happening with all your current projects, not just one at a time. This feature is a real plus for painting contractors who tend to have several projects to manage simultaneously. The service is sold on a “seat” basis, so you pay only for the number of people who are actively using the service, not for the number of projects you have active. Constructware hosts the data and provides the viewing software; all you need is an Internet connection. The user interface is simple and concise. The service works well over a 56k dial-up modem and is one of the few that will work reasonably well even with a 28.8k connection. As with several other project extranets, Constructware will include a free web site that you can use to highlight your project or to provide basic information about your firm.

As Scott Unger, president and founder of Constructware says, “Constructware is subcontractor derived and customer driven. We try to keep our finger on the pulse of the industry through our construction contacts. We have grown out of the construction industry. Our products’ roots go back to 1991. We’ve had customers on-line since our prototype

was released in 1995. Our aim is to improve communication and cross-company consistency. Today’s Constructware is a result of the needs of our customers.”

“ **SOME INTERNET COMPANIES ARE TRYING TO CHANGE THE WAY CONTRACTORS MANAGE THEIR JOBS.** ”

Buzzsaw

Buzzsaw (www.buzzsaw.com) is a spin off from Autodesk, the computer-assisted design (CAD) software giant. The company knows a lot about selling software and setting a standard for the construction industry. Whether it knows how to provide project management services and de-

velop a viable model for funding that service is yet to be seen. Currently, Buzzsaw offers a free site to anyone who signs up. You get a place on the Internet that you can mold to your desires. You decide who has permission to visit the site or portions of it as well as read and write information. You also decide how the information will be formatted. Users have to download and install a shell program called Project Point to get full use of the site. Viewers are offered for Auto-cad files, and the system handles many typical file types. There is no charge for the software nor are there per user fees.

However, as mentioned above, that free-for-all concept is changing. Previously, the size of the free site was 100 MB—enough to manage most small to medium jobs if you clean up your garbage. Now Buzzsaw charges a fee

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for all sites using more than 25 MB—a pretty minimal amount of storage for a construction project these days.

This change also is a pretty good example of the industry—everything is in a constant state of flux. The rules change from day to day, and one of the real risks is that if your company commits to a particular firm or software, the

ground rules may change. The company may be sold or go out of business; the payment structure for hosting your data may change; or other significant curves could be thrown your way. It is unlikely you will lose your data, even if the company fails, but converting to a new format and re-training your personnel can be an expensive chore.

Project Management is just a part of the greater vision that Buzzsaw has for construction in the new millennium. Larry Wares, co-founder of Buzzsaw, has been trying to move the construction industry to use technology tools for years. As the developer of Bidfax and a contractor himself for many years, he understands the construction business and is one of the few industry executives with construction experience.

Larry Wares shares his views: “Our vision is all about knocking off the pain points in the construction enterprise. We talk internally about Bob the Painter—really we do! What are Bob the Painter’s problems? One is getting the necessary information to successfully bid jobs. He can spend all day traveling from general to general and [from] plan room to plan room glad-handing and taking off jobs with a hit ratio of maybe 5%. There has to be a better way. Especially when the economy cools, as it must. Buzzsaw will offer access to information, assisting the general in contacting Bob the Painter when a job comes up. Buzzsaw services will be able to either put the plans directly into his hands or even provide a quantity survey completed and endorsed by the coating manufacturer, so Bob the Painter just has to concentrate on what he does best—bidding and getting the project.”

SUMMARY

Project collaboration over the Internet is an emerging and growing industry. It promises to be a powerful tool for forward-thinking contractors and owners. Both will gain from the improvements in communication and the savings in turn-around time and document shipment costs. Keep an eye on developments and consider using one of the basic or free services for your next project. You may surprise yourself or your client.

Painting projects may especially benefit from these new tools. Construction drawings are not normally complex or numerous for painting jobs. Therefore, high-speed computers aren’t essential. Timely responses to field generated

RFIs and resolution of problems or disputes, however, are critical. Web-based communication provides speed and accountability. Consultants, such as inspectors, certified industrial hygienists, and structural engineers, are to be kept in the loop. Owners can know exactly what is happening today. Infrastructure is often in place at the owner's site, so connections to the Internet should be less of a problem than for other grassroots construction projects.

Even if you are not ready for project collaboration over the Internet or your own web site, there are other services that will help you do your job, from e-mail for quick correspondence and easy distribution of documents to sites specific to the paint industry where you can purchase and download test methods, recommended practices, and specifications necessary for your projects.

