



# Tech Trends

BY CHRISTIAN BURGER AND STEPHEN GUDE

**T**echnology “trend-spotting” can be fun; but, it can also be useful, helping those responsible for planning, selecting, and implementing new technology solutions that may be in the offing in a year or two. And, it can serve as a yardstick to help gauge where your company falls on the technology curve. With that in mind, let’s look at five trends we think will be influential in the next **12-24** months.

## Human Resources

Increasingly, contractors are demanding better tools to manage applicant tracking, employee benefits administration and maintenance, safety, drug testing, and other elements of the HR function. So, over the past few years, HR applications have evolved from being just a modest subset of the payroll application into sophisticated stand-alone modules that may or may not be integrated with other systems.

### Trends in Tracking

From a trend standpoint, HR tracking applications should be viewed from two perspectives: pre-employment administrative functions and employee administration processes.

Pre-employment functions are those tasks that must be completed up to the point an applicant is hired. Some vendors have already developed (or are developing) advanced applicant-tracking systems. These allow an administrator to enter applicant information or requirements (such as skills, salary or wage requirements, willingness to travel, language proficiency, certifications, and other criteria) into a standardized database. Once this information is captured, managers who need a person or group of people with specific skills, experience, or certification can query the database for people who fit the criteria.

These applications can be adapted for use on the Internet. Some companies have self-service “kiosks” that allow prospective employees visiting the company Web site to enter a page

or two of information into an applicant database. (The software then filters out unqualified people when a search is being done.)

Once an applicant is hired, the tracking system can work to ensure that proper procedures are followed. For example, the system would warn a payroll operator or HR administrator if an employee keys in “time entered” without turning in an I-9, Employment Eligibility Verification.

Some contractors are already using high-quality stand-alone HR applications; others are pressuring their enterprise system vendor to develop or enhance integrated applications for some very good reasons.

### Trends in Integration

Integration with payroll may be one of the more crucial aspects of a first-rate HR application. As both the payroll application and the HR module become more sophisticated and comprehensive, the integration of the two becomes more critical. Take benefits administration. Frequently, the amount (or length) of time worked, or the actual number of hours worked, is used to trigger an employee’s benefit eligibility.

With an advanced, integrated system, employees can elect eligible benefits by accessing a “self-service” Web application; this way, they can easily review their options and make their election from their personal computers. Once the election is made, the system triggers the appropriate payroll deductions.

So, from the comfort of home, employees could access their:

- earnings history,
- benefits *summary*,
- vacation time taken, and
- critical company dates, election anniversaries, etc

A system such as this can significantly reduce the time HR administrators spend providing this information to employees.

*continued on page 84*



- XML standards must be written and adopted;
- Software vendors must develop to XML standards;
- XML capable systems must be implemented and rolled-out within construction companies and those of their trading partners; and
- Cross-company and inter-company business rules must be written and either embedded into the core systems or developed as stand-alone middleware system(s). Such systems must provide for data and system security and have the ability to validate, scrub, review, reformat, and revise incoming data.

So, what can you do to get ready for XML? Several things come to mind:

- Actively participate in the development of XML standards;
- Promote the adoption and use of standards among your trading partners;
- Understand your software vendors' strategies, timelines, and progress for supporting XML; and
- Incorporate XML into your IT strategic plan: What are the various software vendors' XML strategies and what are their abilities to execute these strategies? Should you implement new systems and, if so, when? How does/will XML affect your plans for integrating your own internal systems?

To decide *when* and *where* to focus your initial XML implementation efforts, first consider *which* trading partners are most likely to be early adopters of XML-capable systems. (Hint: Look to technology savvy and/or highly regulated industries such as banks, utilities, and materials suppliers.) Then, consider *where* your company generates the highest volume of transactions, and *what* those transactions are.

“Remember: Even the most sophisticated applications are of little use to contractors unless they have been designed with certain construction requirements built in.”



## Conclusion

These are a few of the significant trends we *see* impacting construction companies and their information systems over the next 12-24 months.

Worrying about these trends should never take the place of good system fundamentals – like paying attention to training, implementing the systems and technology you do have well, and carefully working with your user community and vendors to take advantage of all of the systems you do have. It is here that you will get your biggest payback from technology.

But don't **dismiss** the glare of "new and improved" technology entirely. It is helpful for planning and implementing your systems of the future. **BP**

---

CHRISTIAN BURGER is the President of Burger Consulting Group located in Chicago, Illinois. Before establishing his own consulting firm, Christian was a management consultant for FMI for eight years and a client manager for J.D. Edwards for one year.

Christian received his BS in Accounting from Ball State University in Muncie, Indiana and recently completed his MA in liberal Studies from Northwestern University in Evanston, Illinois. He is a member of CFMA's Chicago Chapter, a previous author for CFMA Building Profits, and a frequent speaker at industry events across the country

Phone: 630-5101875

Fax: 630510-1984

E-Mail: crburger@earthlink.net

STEPHEN GUDE is a Consulting Services Director for RealFoundations in Dallas, Texas. Steve has more than 17 years' experience in the A/E/C industry, including 13 years in civil engineering project management and company operations. For the past four years, he has been providing information systems and management consulting services to the construction and real estate industries.

A registered Professional Engineer in Texas, he holds a BS in Civil Engineering from Texas A&M University in College Station, Texas and an MBA from Southern Methodist University in Dallas.

Phone: 214-292-7014

E-Mail: stephen.gude@realfoundations.net

Web Site: www.realfoundations.net

At the same time, it allows companies to track the total overall cost per employee of all benefits being provided.

Many companies use their HR application for asset tracking, a straightforward, but important, capability. When an employee is assigned a cell phone, car, pager, credit card, or other company asset, the assignment is recorded in the employee's record. When that employee is terminated, the system can tell a manager what needs to be returned.

### **Trends in Safety Compliance**

The better HR systems come with a full suite for safety tracking and administration, as well as for OSHA reporting. The integration of the safety function with payroll can be useful – such as when reporting hours worked without a lost-time accident for the contractor's safety incentive program. Remember: Even the most sophisticated applications are of little use to contractors unless they have been designed with certain construction requirements built in.

Compensation tracking is also becoming more prevalent in HR applications. This function is used to maintain a perpetual history of all changes to an employee's earnings. It can track increases, as well as various bonuses, and the dates they were given. If a raise is scheduled as of a certain date, the HR

system would update the employee's record in the payroll function at the appropriate time.

One final element gaining prominence is the administration of training and education data tables. The system should be able to track requirements for training and/or certifications, as well as the employee's attendance and results. This can provide a manager with useful information for tracking both employees who are falling behind on their training, as well as the cost of the training programs to the company.

### **EIS & Data Warehousing**

Two significant and related trends particularly for mid-sized and larger contractors, are Executive Information Systems (EIS) and data warehousing. Both are going to be used to a greater extent over the next several years to increase the efficiency of operational systems and to make more concise real-time information available to those who need it.

### **Trends in Storage**

Increasingly, companies are storing data electronically in one or more databases. But applications are not at their most efficient running day-to-day tasks when they are also storing files and tables that contain two or more years of data.

However, someone doing analysis or comparative reporting may need that historical information or may need data from multiple databases, such as job cost and estimating. To keep systems operating at peak efficiency, data should be regularly moved out of the database when it is no longer needed. But where do you put it?

Enter the "data warehouse."

A data warehouse is a database that stores needed company information online, but away from the day-to-day operations of the system. It does not have traditional functionality, so you can't write a check or process a forecast. It can, however, store data from multiple applications, and then allow those users with report-writing and query tools to easily access the information. In this way, the warehoused data does not interfere with the operational data and queries do not divert processing resources from the main system(s).

### **Trends in Tools**

There are a number of good examples of business intelligence software on the market today. These sophisticated tools are complex to set up; but once running,

**FERRELL**  
**COMPANIES, INC.**  
**Win-X**

Visit Us @ [www.ferrell.net](http://www.ferrell.net)  
 Call 303-233-2400

**Are you tired of a "canned" accounting system that forces you to run your business their way?**

**when it doesn't fit, it just plain doesn't fit • that's why we bring our most important tools to the job... Our EMS!**

- How many systems track the same data? How many different coding structures do these systems represent?
- Which system(s) should be the control point for the entry of different types of records? How is cross-system security and data integrity assured?
- Does the integration need to be real-time or can it be batch-processed? What happens when one record in a batch is wrong? How will you track, report, and fix exceptions? Do you need an intermediate control process for reviewing and approving records before upload?
- Are you going to replace or upgrade any of your systems in the near future? How will **this** impact the timing of an integration project?
- Who will be responsible for maintaining the compatibility/integrity of an integration when the integrated products release an upgrade or new version? What happens with an upgrade or new release of the EAI/middleware?
- Which of the 30+ EAI/middleware products will work best for your company? Will the middleware that you select today still be viable when you “deepen” (or expand) an integration or add another system into the mix tomorrow?

System integration is the wave of the future, and has already been successfully accomplished at construction companies. Additionally, a few software vendors have developed commercially available integration solutions. And, too, vendors are collaborating on integration requirements and pooling resources to share the cost of developing integration tools for their products. These tools have the potential to alter many companies' IT strategies.

“**T**ools that larger, more complex corporations have been using . . . are now making their way into the construction industry.”

## XML

According to *CFMA's 2000 Computerization Survey for the Construction Industry*, there **are** over 88 different financial systems in use by the industry. Add to that the systems in use by the industry's trading partners (materials suppliers, banks, etc.) and the number of systems becomes daunting. The big question is, “How do we get all of these systems to talk to one another?” The answer is complicated by the fact that each system has its own method for reading, writing, and interpreting the same types of data.

Several years ago, Electronic Data Interchange (EDI) tried to solve this problem. Using EDI technology, trading partners exchange data electronically (by tape, modem, or Internet) in a file format developed specifically to be read by the other's systems. EDI was, and remains, cost-prohibitive because individual interfaces must be developed for each trading partner, then maintained over the life of the interface.

Enter extensible Markup Language (XML). XML is a standard language for describing documents and data **through** the use of <tags>. Each document (or record) and data type can be assigned a standard tag, such as <Invoice> or <Amount Due>. With XML, systems need only translate to and from one standard. And, unlike EDI where the focus is on financial data, XML can be used to define financial, design, estimating, scheduling, product, and other data sets.

The success of XML rests on two “must-meet” requirements:

- 1) There must be a standard (each document and data type must be described by one – and only one – tag);
- 2) It must be non-proprietary (available to everyone for use in coding and translating electronic documents).

**This** does not mean that everyone must use the same invoice format or estimate template, only that everyone must call an invoice an “invoice” and that each data element must use the same tag or label (invoice date, due date, amount). **This** consistency allows one system to interpret a file or transaction from another system.

At last count, there were over 30 organizations in the process of writing various industry and cross-industry XML standards. In the A/E/C industry, aecXML ([www.aecXML.org](http://www.aecXML.org)) is being developed under the administration of the International Alliance for Interoperability (IAI). IAI's membership includes software vendors, architects, engineers, and construction companies.

The XML promise – seamless, intra-company and cross-company integration of disparate systems – is still years away from being widely **used** by the industry. Many things need to happen first, including:

*continued on page Y0*



- Graphing tools in the reports, along with ratio analysis and footnoting.

A tool that delivers all **this** also delivers the potential for easier production of a much more complete (and impressive) financial package.

However, these packages are not without cost, which can be as much as or more than a single application of your enterprise system. Of equal concern is the time it takes to learn and build the templates, which can sometimes require the assistance of a consultant.

If you are considering such a tool, give careful consideration to your current and planned operations, financial reporting structure, and chart of accounts, as well as your existing financial history, before setting out to design your new report package.

### Systems Integration (SI)

Most construction software systems were initially developed as stand-alone applications, each with its own proprietary database. Best-of-breed systems (BOBS) emerged that served specific business functions very well (estimating, back office, job costing, scheduling, etc.), but resulted in business-process inefficiencies from duplicate data entry, updates, and storage in multiple databases.

### Trends in SI

Several developing trends and technologies are making it easier for companies to integrate their islands of information, thereby eliminating duplicate data entry, improving accuracy, and streamlining the business process:

- Software vendors are standardizing their products on robust, relational databases (e.g., Microsoft SQL and Oracle), thus providing easier access to data by other systems. Another benefit? Sharing of database administration for multiple systems on one type of database.
- Some software vendors are developing open Application Programming Interfaces (APIs). APIs are programs written by the developer of one application for the receipt, validation, importing, and posting of data from another system.

For example, if a software vendor writes an API for change orders, its system will not care where the change order record comes from, only that it is in the specified format. Once in the designated file folder, the system can pick up the file, check to ensure the data is valid, import it into the system as if it had been keyed in, and post it accordingly.

This type of interface does not depend on the type and nature of the system it is receiving from, only that it is in the expected format and in the right place. This means an interface can operate much more like true integration with real-time posting, rather than manual batch processing at the end of the day.

- Enterprise Application Integration (EAI) software and “middleware” (software that connects two otherwise separate systems) have emerged to facilitate the movement of data between application databases. Once developed, EAI and middleware solutions are “portable” (meaning portions can be re-used from company to company), allowing for more rapid and less costly integrations.

### SI Considerations

Construction companies become more efficient by integrating their BOBS. But many considerations must be addressed both before and during an integration project, including the following:

*continued on page 88*

**Construction Software Solutions  
Designed for the Contractor  
...by Contractors!**

- Accounting
- Project Management
- Service Management
- Equipment Management
- Materials Management

**FERRELL COMPANIES, INC.**

**(303) 233-2400**      **www.ferrell.net**

The advertisement features a background image of a construction site with cranes and a worker in a hard hat. The text is overlaid on this image. The company logo includes a stylized eagle.