

## Building a Solid Knowledge Foundation

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Data filed away in your company is costing you money on projects. For a moment, forget everything you know about the way your company operates on a job. Forget the way you prepare a bid, assemble an estimate, track job costing, allocate labor, and share information with project managers. There could be a better way to do each and every one of these tasks.

The good news is that the key to these improvements may very well already exist within your organization in the form of data. The data from past projects, data located at dispersed corporate divisions, and data contained throughout various departments within the company could all help in this manner. Yet more often than not, this data is filed away somewhere within the organization, inaccessible to estimators, controllers, and project managers that could greatly benefit from tapping into this knowledge for current projects.

A company's ability to establish internal collaboration between departments and corporate divisions can be the missing link in the chain of developing better process efficiency.

At the heart of this process is IT (information technology). As opposed to static spreadsheets, today's IT applications that leverage Web-based technologies and contain flexible databases can help turn standard software solutions into knowledge banks for a construction company. These tools can lead to better decision-making capabilities and turn a construction firm into an intelligent enterprise. From estimating to project closeout and every stop in between, opening your company's virtual file cabinet can have a positive influence on every aspect of the construction process.

### Collaborative Estimating

The average estimating team typically has a short window in which to create an estimate and often faces many risk factors and unknown variables in the process.

This degree of risk increases when they begin estimating for a project in which they have never worked on prior. Yet, oftentimes there are other divisions in other parts of the country within the organization that have worked on a similar type of structure. Gaining access to this estimate data is knowledge that could help mitigate the level of risk for the estimating team as they enter the job.

Greg Williamson, director of preconstruction services with construction management firm Walsh Brothers Inc., [www.walshbrothers.com](http://www.walshbrothers.com), Boston, Mass., admits that while no two projects are exactly alike, it is helpful to tap into past estimating data in order to view breakdowns of components or pieces when estimating current jobs. He says this helps acquire accurate detail costing and confirm benchmark values on a job.

Using eTeam collaborative estimating from WinEstimator, [www.winest.com](http://www.winest.com), Kent, Wash., the company hosts the solution on a Citrix server, which allows its team of 15 estimating professionals to access the program from outside the office. The tool is also hosted on the company's intranet, allowing for better interoffice access.

"Through the network we've put estimates together where we share resources from multiple offices," says Williamson. "With the appropriate coding in the work breakdown structures, if you are breaking down an estimate by areas, floors, departments, functions, etc., you can go into the filters either to look at the complete detail of the estimate in a viewed report—or from a summary level."

This allows him to go into estimate tables, where he can see, with various metrics for the area, either the square footage of the area or a breakdown of costs per unit. He can distribute the gross costs right within the table and view such factors as what trades will cost on the area of the job.

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At its core, collaborative estimating involves storing estimating data in a central repository on a company network. This requires technology containing a robust database that allows users to conduct quick search queries associated with various data elements.

Corecon Technologies, [www.corecon.com](http://www.corecon.com), Huntington Beach, Calif., has built its Corecon 2006 project management/estimating product on the latest Web technology and leverages Microsoft SQL Server 2005, a comprehensive database software platform. The online capabilities help facilitate better external collaboration during the estimating process—making it easier for estimators to collect and update pricing information from subcontractors and suppliers.

The flexibility of the database built by Corecon helps internal collaboration during estimating, as opposed to a typical spreadsheet. This gives estimators across various divisions the ability to quickly access historical price information, supplier pricing, and various industry-standard cost databases. In turn, it helps users share and standardize estimating data across the company.

Mickey Carr, program manager with U.S. Cost, [www.uscost.com](http://www.uscost.com), Atlanta, Ga., which provides a Web-based collaborative estimating system using Microsoft SQL Server 2000, says the benefits of collaborative estimating extend beyond just the estimators. Management, for example, can get a more detailed view into the actions that are impacting an estimate, such as fluctuating material prices.

“With a Web-based platform you not only have a robust detailed estimating system available via a Web browser, which allows all to collaborate on a project, but you also have other stakeholders available in the process that can check the progress of a project at any time and ensure they are seeing realtime information,” says Carr. “There is no way to get this via a spreadsheet, you need a centralized system.”

Web services allows the software to interact with other mission-critical applications across the enterprise, sharing data in both a push and pull manner. Carr says this goes beyond simple collaboration, now exposing companies to a SOA (service-oriented architecture), which enables disparate applications to talk to each other without commonality of an underlying platform.

### **Future Costing**

Large public owners face mounting pressure to establish consistent budgeting on capital growth plans. For this very reason, the use of historical job cost data has become a valuable asset to planning professionals within these organizations.

As a multidisciplinary healthcare system serving more than five million people in Long Island, officials at the North Shore Long Island Jewish Health System (NSLIJ), [www.northshorelij.com](http://www.northshorelij.com), New York, N.Y., estimates it has commissioned roughly 350 projects to various stages of construction throughout the past three years. During that time, NSLIJ has tracked costs and budgets using Prolog project management from Meridian Systems, [www.meridiansystems.com](http://www.meridiansystems.com), Folsom, Calif. The organization uses The Cram Group, [www.thecramgroup.com](http://www.thecramgroup.com), New York, N.Y., to host the solution via the Web and for full-time onsite database administration.

Bernie Dubin, vice president of project management with NSLIJ, recognized early on that if cost data was recorded into the database in an organized and consistent manner, this would allow construction and facilities management to use the system as a knowledgebase for capital planning.

“We have a report we generate from the database that gives us a couple of sort capabilities to determine what construction costs should be (cost per sq.ft.) for about 15 different project types,” says Dubin. “We can query the database in a variety of different ways and can pull data out for new construction—generating cost data and adjusting for escalation—unique to each project. We know that the more information we put into the database as custom fields, the more data we can break out. In Prolog we can group data by fields or we can query various lines items in the budget to see averages.”

Other reports track historical information related to consulting fees, inspection fees, architecture/engineering fees, and equipment costs, all providing a base to help NSLIJ measure historical construction costs entering a new project.

Dubin says the key to this entire process is getting the information into the database in a consistent manner. Helping ensure data integrity, NSLIJ created roughly 140 cost codes, which project managers use when entering information.

"The data comes with a fair amount of confidence," adds Dubin. "We publish our Prolog reports on a monthly basis for senior management to see. As a result, when we quote Prolog regarding historical data they know data is accurate. We have a fairly transparent database—we don't open it to management but do report off of it, so they are seeing results. It eliminates a lot of credibility questions."

A developing project between NSLIJ and The Cram Group is an electronic invoice system that will extend the knowledgebase to vendor invoicing procedures. Cram Group's portal, which hosts Prolog for NSLIJ, uses Microsoft .NET; a group of technologies that facilitate the open exchange of data between disparate systems via the Web. This enables various workflow software tools to interact with the project management tool.

He adds, "When a vendor logs on to the portal via the Internet and posts an invoice, he picks which contract it is associated with. This opens him up to a great deal of information, via Prolog, such as what we have approved to date, change orders approved, invoices that are in progress, etc. This gives the vendor an instant statement of where he stands with his contract; all of this data comes via our accounting software."

Inline with building an internal knowledgebase at the company, the portal equips NSLIJ with historical invoice analysis. Explains Dubin, "In the past I have had project managers reject invoices, yet not record the fact they have informed the vendor. After he leaves the organization, I would get a notice from the vendor regarding payment. Since the project manager kept no record of (the interaction) I would end up having to pay. What this now provides is a history of invoices and all interaction associated with an invoice."

Critical to building a job-cost knowledgebase is ensuring the data you are capturing and storing is indeed accurate. Next comes employing the right technology for storing the data such as document imaging.

When it comes to accessing information, Fred Ode, CEO and chairman of Foundation Software, [www.foundationsoft.com](http://www.foundationsoft.com), New Brunswick, Ohio, says it's less about the database and more about the underlying technology.

"Well-designed software—applications that leverage such things as faster processing speeds, greater storage capabilities, and the Internet—provide the flexibility that helps companies easily extract data from the system," says Ode.

He adds, "With the right technology, all a contractor has to do is know when they invoice a customer, what job is it against and when they pay a bill, whether material or subcontract, what job they are paying this against or how much of it goes against different jobs. And when employees are working, how many hours and on what job, and the same goes for equipment. This is all important because when they are billing a customer they know the job and when they are paying a bill they can generally allocate exact dollars to every job."

Commercial design/build firm Design Structures, [www.designstructures.com](http://www.designstructures.com), Middleton, Wis., uses document management from HeadsUp Technologies, [www.headsupotech.com](http://www.headsupotech.com), Overland Park, Kan., to standardize subcontracts, purchase orders, and change orders, which are subsequently copied to the company's accounting system. Web-based capabilities of the system allow the centralized information to be accessed across three corporate offices at any time.

In some cases, the data becomes a marketing tool for the company. Its business development group displays current and completed projects for showcasing to potential clients.

### **Department Flow**

Establishing better internal collaboration can help open up data flow throughout the entire organization. Detrimental to this process, in many cases, is the fact each department is working with a mesh of disparate IT systems and workflow procedures.

Jason Burns, director of integrated systems with general contractor Hunter Roberts Construction Group, [www.hunterrobertscg.com](http://www.hunterrobertscg.com), New York, N.Y, expounds on the frustration involved. He says, "In some companies you are (using) systems where, let's say administrative assistants are processing data back and forth between different groups but the programs they are working with (are different.) From there you then have other groups that put together reports that tie all of this information together in order to do something like a financial statement."

Founded in 2005, Hunter Roberts was derived from a group of contracting firms. With a chance to start from scratch, per se, company officials took lessons from the inadequacies of running disparate IT systems in previous companies and decided to implement one integrated system from CMIC, [www.cmic.ca](http://www.cmic.ca), Toronto, Ont.

"Each department is dependent on one another, so in essence you are all actually working in a lifecycle of a job together," says Burns. "You cannot do your work without the person before you doing theirs—it's fun, but it can be very frustrating at times."

An underlying benefit is each department is exposed to all information that influences a job. For instance, at Hunter Roberts the project managers are inputting information into the system, such as a change order, knowing the data will ultimately affect the bill that is sent to the client or the way financial statements are assembled internally. It requires a bit more communication between departments than companies may be accustomed.

"We share information globally and at the business level. At a corporate level I can run a report on FedEx to see what we have spent for the whole company. In other cases I can see how different divisions have spent money on things like customer development," adds Burns. "You are now accessing data across the company you were not able to get at prior—a look at total impact from all types of systems and what it truly costs you to do your work."

Building a knowledgebase to aid in the development of future projects is the direction the company is currently headed. Burns adds, "The goal is to look up these things online to tell us lump sum how much we spend on (specific jobs). Our people are already asking for this." Like Hunter Roberts, many construction companies are still in data collection mode. Once the data is in the system, the user interface will enable companies to view information most appropriately for their tasks.

Technology has long carried the promise of providing users with the power of information at their fingertips. With that in mind, it may be time to tap into the data filed away within the company. You'll be amazed at how it can improve your job.