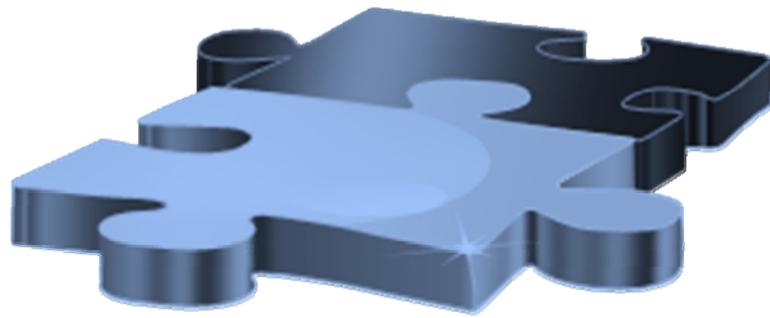


superior financial and project management systems for architecture, engineering and construction companies

Computer Guidance White Paper

## Integrated Approach To Construction Management



**COMPUTER  
GUIDANCE**  
CORPORATION

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## Executive Overview

Companies in architecture, engineering and construction verticals have recognized that business automation and optimized information management are essential to achieve productivity, revenue, profitability and customer satisfaction objectives. However, most companies still struggle not having integrated financial and project management data as well as streamlined construction management processes because of disjointed technology infrastructures. The construction industry is a key contributor to the global and domestic market; as the economy fluctuates, construction companies must proactively plan, adjust business operations taking into account the interdependencies of skilled labor shortages, resource management, market demands, and complexities of financial, surety, and legal disciplines. To cope with the ever-changing construction industry, Computer Guidance Corporation emphasizes the importance of implementing integrated solutions for all financial and project management needs.

- A fully integrated enterprise solution suite from one solution provider is the ideal choice
- Financial and project management data and processes must be integrated
- Web browser-based solutions provide real-time and remote access to the ERP system
- Single database structure ensures accuracy and timeliness of integrated data
- Productivity tools developed within the enterprise-suite or tightly integrated at API level with third-party solution providers facilitate workflow improvements
- Advanced reporting, rules-based alerts and informative dashboards offer business intelligence and proactive measures

This white paper makes the case why an integrated approach to construction management is the ideal choice supported by a detailed overview of available technologies and their return on investment.

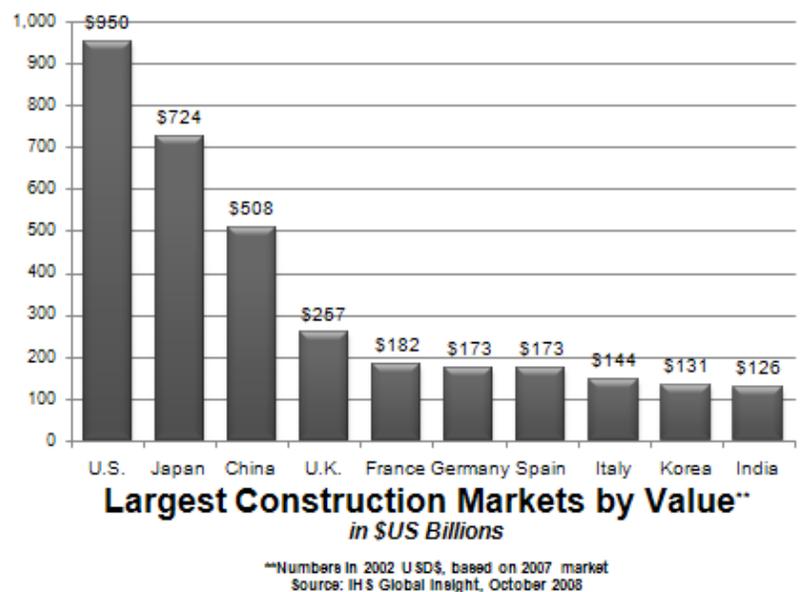
## Construction Industry Today

Does your organization's performance have any impact on the US and the Global economy? We will let you decide that after you carefully review the following economic facts.

The Global Construction Industry is estimated at \$5.6 trillion, in which the United States represents the largest percentage followed by Japan and China. In 2008, the US Construction Industry was valued at \$950 billion and today it has exceeded the 1 trillion dollar mark. Due to the recent financial crisis, the US Construction Industry experienced a 14% decline in Construction Starts in 2008 from previous years, and it is predicted to stay at current levels over the next 12 to 18 months. However, economists forecast an aggressive growth where the current US market size of the construction industry will increase by 40% by 2013. In addition, we are all aware of the American Recovery and Reinvestment Act of 2009 (a.k.a the Stimulus Act or Stimulus Package) that was enacted on February 17, 2009 with a value of \$787 billion. Approximately 16.5% or \$130 billion of the total value was allocated to construction-related spending for 2009 and 2010.<sup>1</sup>

What do all these economic statistics mean? One thing is certain, the US Construction Industry has suffered in the past several months, but economic data shows that the economy will rebound and the construction industry will look toward a brighter future by 2011. While the economy takes its course of recovery, construction companies must run their operations lean and allocate their resources carefully and strategically. Companies also need to position themselves for long-term success, and at the same time they need to be prepared for fierce competition today and in the future. Operational efficiency and productivity improvement initiatives are imperative and latest trends in construction building cannot be ignored. Companies who plan ahead and stay competitive will sustain current business levels and will thrive once the economy has recovered. Those who invest in the right technologies and build advanced skills for their labor force will be rewarded for their perseverance.

Whether or not you accept that you have an impact on the US and global economy, your construction company is greatly influenced by these economic conditions.



## Challenges Construction Companies Face

Companies have a more difficult time today securing timely, flexible and favorable financing for construction projects and, therefore, many projects remain on the shelves or are granted to the competition. The bidding process has become more extensive, with new regulations and requirements, as a result of the Stimulus Act. The number of companies that are bidding for the same projects has increased tremendously, which drives construction pricing down and makes the management of subcontractors, human resources and other resources into an even more intricate process. And, when projects are received, the risk is high as each project must be completed with the highest quality output – on time and on budget – to secure future business, financial payments and on-going relationships with the subcontractors.

## Benefits of Fully Integrated and State-of-the-Art Technologies

Construction organizations are realizing major efficiencies with fully integrated technology solutions that extend far beyond financial and project management. Contractors now have access to sophisticated and innovative technologies for accounting, job costing, and project scheduling that also incorporate document imaging, electronic workflow, electronic forms, service management and human resources. With a fully integrated solution running in a single database environment, companies eliminate duplicate information and gain immediate productivity. One all-encompassing solution from one source allows for a single point of

data entry, free flow of data from one application to another, and real-time, immediate access to business-critical data for intelligent decision-making.

Today there are abundant innovative technologies that are capable of managing repeatable and customizable business processes. These technologies have automated business processes to provide much needed accuracy by reducing manual data entry and processing, and to increase operational efficiency by having expedient access to information. However, most technology solutions are only capable of handling one part of the business operation, while other areas of the business are run by manual processes or on a separate software package operating stand-alone. Top management no longer accepts the problems and redundancies inherent in multiple systems with duplicate job setup, or running one accounts

receivable application in the service division and another in the construction division.

In most cases, construction companies have multiple home-grown or independent software solutions— a



financial system from one vendor, a project management system from another, and perhaps a service management system from a third — none of which are integrated with one another. Having mobile communication technologies on the rise now allows project managers and service teams to spend more time at remote job sites servicing customers and executing on projects while communicating with the back-office. An integrated system brings together numerous financial and project management applications and provides seamless and real-time communication. Core financial applications handle general ledger, accounts payable and receivable, purchasing, payroll, and human resources. The project management side of the integrated system enables the management of field operations. Submittals, drawing logs, meeting minutes, punch lists, and other documents and information can all be viewed, updated, and shared using one enterprise-class solution. A significant benefit lies in the implementation of Web browser technology, where data and reports can be conveniently accessed by authorized users in any office as well as from the field.

For example, Parsons Electric, a Minneapolis-based electrical services firm, normally has about 200 active construction projects at any given time, many of which are large and complex. Parsons averages some 5,000 service-related work orders annually. The company has experienced enormous growth — from \$50 million in 1996 to a 2008 projection of close to \$200 million. Rapid growth has led to a scarcity of well-qualified candidates for an expanded field team, which requires Parsons' experienced project managers to manage more projects while maintaining a superior level of quality and cost control.<sup>2</sup>

Another example is Tri-City Electrical Contractors, where the company has added only one person to its accounting staff since 1997, yet it has grown revenue from \$75 million to \$156.8 million. This was accomplished by having in place one integrated construction management system. Prior to utilizing Computer Guidance Corporation's eCMS solution, Tri-City Electrical Contractors had an unbilled-work backlog of at least 60 days and it could take up to three weeks to review before invoicing. Now, with eCMS, Tri-City Electric has completely eliminated the backlog — it takes only seven days to review and bill these same invoices. While productivity could be increased and processing of invoices could have been expedited management did not have the capability to automate the review process before the invoices were sent.<sup>3</sup>

An advanced financial management solution is simply not enough to achieve the necessary productivity gains and profitability measures. Additional tools such as project management and productivity tools are necessary.

Our current challenging economy requires precise financial management. Efficient and effective management of current financial accounting activities is vital to the bottom line, not to mention accurate forecasting, daily cash flow and timely financial reporting. This is again only achievable if all aspects of the business are managed by a single and integrated solution that has the features and functionalities needed for the entire construction operation.

Projects are becoming more complex and unique in nature. The environmentally-friendly "green building" movement adds additional requirements and more complex workflows. Project managers have the respon-

sibility to plan, execute and deliver some of the most comprehensive and extraordinary projects. They cannot miss deadlines that lead to cost overruns nor can they jeopardize job quality by not being able to have resource, financial and project information on hand to make timely and intelligent decision.

Since the implementation of Project Collaborator at AGI General Contractors, the company has experienced improved communication and increased productivity across the entire organization. It has made a significant difference having a fully-integrated and single database for all project management and financial solution needs indicated Jackie Buck, VP of Finance at AGI General Contractors. Data entry, archival and retrieval processes are delivered in an accurate and timely manner with easy, remote access to one system. Project managers can focus on servicing customers, managing human resources onsite, and coordinating activities and materials in order to complete projects that exceed expectations.<sup>4</sup>

Optimum productivity comes from the underpinning productivity tools such as electronic workflows, document imaging, electronic forms creation and management, innovative dashboards as well as the latest evolution of GPS and Business Information Modeling (BIM) technologies. Productivity tools come in many flavors and with one common benefit – automation.

Thankfully, within recent years electronic document imaging and workflow systems have come to the contractor's rescue. Using a Web-based electronic imaging/workflow solutions, a contractor can quickly scan documents into the system to be stored, cataloged, retrieved, and shared. Through an interface between the company's financial accounting system and an integrated financial accounting system that includes an imaging/workflow application—single or multiple image files can be assigned to another application, an accounting discipline (accounts receivable/payable, general ledger, etc.), or project for retrieval. Electronic storage and retrieval gives the contractor company-wide access to important documents. The project team is able to generate electronic records of invoices, documents, and other information for authorized users to control, share, and store. This provides decision-makers with fast and easy access to business information. Simply put, automation saves time and money.

Joe Bland Construction recognizes that the immediate savings are on the job costing side, as the process of pulling an invoice, locating a check and manually taking it to the project manager for approval is a tedious one. This procedure is now automated. Information is available anytime and anywhere. Labor-intensive data entry and manual approval processes are nonexistent. Joe Bland Construction estimates that labor savings from automating this one manual process of project data entry and approval is in the neighborhood of \$10,000 to \$13,000 annually at their current business level. Once Joe Bland Construction has leveraged Computer Guidance's Document Imaging and Electronic Workflow applications for a longer period of time, these savings will significantly increase. Not to mention the savings they will gain utilizing the electronic forms (eForms) application. Just the elimination of the storage space alone will provide tremendous return on their technology investment.<sup>5</sup>

Advanced dashboards are interactive user interfaces that gather, organize and present selected information at a single location on the computer desktop. A dashboard not only launches a user's system applications, but also publishes selected data from system applications based on the user's parameters. While standard dashboards are limited by the fact that they are integrated only with the financial system applications that are offered by that particular vendor, the newest dashboards use web-based technology, which enables them to function as a portal — that is, a website with access to other websites. The latest dashboards bolster the construction executives' and project managers' decision-making by placing real-time, user configurable rule-based alerts and critical business intelligence at their fingertips.

The Information Age has evolved technologies to a point where there is a deluge of software available with similar functionalities. It is rare to find construction companies without an IT infrastructure or Management Information Systems (MIS) of some kind. Companies make technology investments to keep up with increased customer demand, strengthen position within the competitive landscape and to process overwhelming amounts of information. Choosing the right technology is one of, if not the, most important decision that a construction company needs to make to stay in business.

### **Computer Guidance eCMS® – Construction Management System**

eCMS has established de-facto standards for architecture, engineering and construction companies' financial and project management needs while supporting their ever-changing business demands with proven flexibility, scalability and reliability since 1981. Accompanied with innovative workflow, imaging, reporting and business intelligence dashboard applications, eCMS delivers an integrated approach to construction management. The eCMS™ browser-based interface allows for maximum accessibility to mission-critical information for those who need it, regardless of their location. Real-time information, combined with core financial applications and integrated productivity tools, means your business can reduce costs by streamlining complex operations. The functionality and evolution of the eCMS application suite has arisen through listening to Computer Guidance clients and continually striving to exceed their expectations. eCMS is built on a single database where data is fully integrated across all 28 applications from financial accounting, project management, human resources, service management and a variety of advanced productivity applications.

In May of 2009, Computer Guidance announced its Hosted eCMS solution. Hosted eCMS is developed on a Software as a Service (SaaS) application platform where users access and operate the feature-rich, fully-integrated construction management software over the Internet through a highly secure Web portal. Users can now leverage the identical powerful financial, project and productivity management applications for their business-critical processes as the traditional enterprise-class eCMS system. The managed services solution eliminates the need for upfront investment, on-premise installation and ongoing management of an IT infrastructure. As a result, architectural, engineering and construction companies minimize cost through a subscription to a pay-as-you-go business model while driving increased productivity and operational effi-

ciency. Hosted eCMS enables construction companies to quickly execute any or all of the 28 eCMS applications, and implement new product upgrades virtually within a hosted data center environment. The Tier IV data center provides increased reliability, redundancy and security with guaranteed uptime and performance standards.

Technology change continues to accelerate at a phenomenal pace. The driving factor behind this accelerated pace is the competitive nature of the software industry. To stay competitive companies deliver in months what used to take years. However, during the 90s the rules changed. Software had grown up or matured from the standpoint of features and functionality. In the old days, the idea was to deliver more interactive capabilities, collect and manage data in an integrated environment, allow the user to manipulate the data in a manner that suited their business model and do this on a hardware platform that was reliable. Companies that accomplished this better and faster than their competition were successful. Computer Guidance's Construction Management System is the perfect example of this strategy. We delivered new product features and functions, sometimes adding entirely new applications that have been fully integrated at a "Blazing Pace" and left our competitors back on their heels.

Our goal has always been to provide a stable product for our clients and stay current on the industries' trends, directions and evolving technologies. Our re-engineering process has rebranded CMS into eCMS with extended capabilities of CMS and migration to a true web/browser based application utilizing JSF technology as the user interface, and the appropriate business language for the business logic. This technology has enabled Computer Guidance to begin the development of pure Java applications and interfaces and integrating this new application set into the existing eCMS applications and data. We released eCMS v.3.7. with more than 200 features to take advantage of the JSF Rich User Interface (RUI) and major functional extensions throughout our application suite.

The eCMS initiative encompasses the migration of our Construction Management System utilizing HTML, XML, Ajax, Java Server Faces and the appropriate language for business logic development, SQL, RPG, and Java etc. as our program languages of choice. This phase involves the development of business data models using Object-oriented (OO) design and incorporation of a Services Oriented Architecture (SOA). OO and SOA provide the backbone for continuation of the Computer Guidance initiative to allow our standard applications to take advantage of the best-of-breed operation systems and databases. Creating a portable product gives us the ability to generate software applications to run on the IBM System i, Windows, Linux,



the Internet, and other new platforms as they are developed.

The development of eCMS provides business-to-business e-commerce solutions using standard HTML, XML, and Web Services that allow us to publish our interfaces simplifying the integration between business processes. For example, the business process to procure or order materials and supplies are part of the web solution that provides immediate availability using the Internet.

Computer Guidance Corporation will continue as it has for over 28 years to research technology trends and consider them carefully as it further develops its leading-edge construction management solution which is developed in house with significant R&D investments.

## Closing Thoughts

What does the future hold? Software solution providers will introduce more and more innovative and breakthrough technologies. What is the best suited technologies for contractors, the current browser-based solutions, or the emerging cloud-based computing? Both have their respective value and place in the market. The browser-based solution offers the added security of managing your own system, but has the added burden of the hardware infrastructure, while cloud-based technologies, or hosted applications do not require in-house IT knowledge and support for a hardware infrastructure. The future has never looked brighter to find solutions for your information management, communication and process automation.

There will be an ongoing development of new feature introductions as software vendors plan on expanding their current offerings for continued growth. Added functionalities will be released at a rapid pace, but will the individual value of these *niche* applications override the integration component of an enterprise system? Customers, and in some cases vendors, will likely become the responsible party for managing the interfaces and data integration of multiple technology sources.

Open-architecture relationship database solutions, such as Computer Guidance, began to dominate most vertical markets. The evolution of cross-platform database solutions with unlimited configuration options and flexibility grew as they removed the barriers to enter into new vertical markets. But, industry-specific business knowledge was difficult to duplicate and often was lost with such implementations. For certain, the required investment for such customization efforts most often exceeded the promised benefits.

Integrated and industry-specific solutions developed on a single platform, yet flexible and scalable to support companies as their businesses change are proven to be the ideal construction software candidate for technology selection today and in the future.

### Sources

- 1 McGraw Hill—Economic Outlook 2009
- 2 Parsons Electric Case Study— available on request from Computer Guidance Corporation
- 3 Tri-City Electric Case Study — available on request from Computer Guidance Corporation
- 4 AGI General Contractors Case Study — available on request from Computer Guidance Corporation
- 5 Joe Bland Construction Case Study — available on request from Computer Guidance Corporation

## About Computer Guidance Corporation

Founded in 1981, Computer Guidance Corporation is the trusted provider of construction management software for architecture, engineering and construction companies. For over a quarter of a century, we have been committed to setting industry standards in financial and project management software development for North America's leading construction companies.

Computer Guidance has the largest customer representation in the Engineering News Record (ENR) Top 400 contractors and Top 50 contractors. Computer Guidance software has been the leading solution among general contractors with revenue of more than 250-million dollars and 100-250-million dollars for the past 12 years according to the CFMA Information Technology Survey. Since 1981, Computer Guidance has been the leading provider of financial and project management solutions to more than 600 enterprise customers from various commercial construction disciplines. Computer Guidance continues to be ranked "World Class" in customer support excellence by independent IBM surveys for the past 20 years.

Our innovative and cutting-edge solutions are implemented and supported by a team of seasoned accounting, construction and technical experts who understand the diverse needs and challenges of today's competitive environment.

Over 600 general contractors, heavy highway builders and specialty (electrical and mechanical) contractors have implemented Computer Guidance solutions throughout the United States, North America, Guam and Puerto Rico.

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