B2B Collaboration Platforms:
A New Paradigm for Buying, Deploying and Using Technology in the Engineering and Construction Industry

By Brian Moore and Scott Unger

"We can't solve problems by using the same kind of thinking we used when we created them."
~Einstein

The Industry’s Unsolved Problem

The construction process has always been fraught with risk and inefficiency. But the increasingly complex nature of projects, coupled with today’s challenging economic landscape, has created a real sense of urgency to find better solutions to the industry’s core problems.

At the heart of these challenges lie the rampant communication inefficiencies that have plagued the industry for years. Poor communication among organizations is still the root cause of most major problems in a typical construction project. It represents the greatest impact on cost, schedule, scope and project quality.\(^1\)

In fact, a number of studies have estimated that up to 30 percent of a typical construction project’s cost is pure waste due to inefficiencies and poor communications among stakeholders. One study concluded that inadequate interoperability and poor communications alone cost the industry at least $15.8 billion annually.\(^2\)

To combat these inefficiencies, program owners, as well as engineering and construction firms, have turned to collaboration software. However, none of these software systems have been able to provide the level of collaboration the industry has been searching for and truly needs. There are four fundamental reasons for

\(^1\) "Annual Survey of Owners 2005. FMI/CMAA. 

this, and until these core issues are addressed appropriately, the design, engineering and construction industry will continue to endure cost overruns, excessive change orders, project delays, quality issues and disputes among project participants.

**Fundamental Challenges Not Addressed by Traditional Collaboration Software**

**Data Ownership Still an Issue**
The first fundamental obstacle is that of data ownership. This dilemma arises from the fact that even though a project may be using one particular system for all project communications and documentation, one stakeholder still "owns" the data. Because most systems today don’t share data with other systems, the other parties in the project must maintain their own systems—in addition to the project-mandated software—just so they can keep a full record of all project communications. This creates a number of costly redundancies, poor visibility and control, and lengthy communication cycle times.

Software companies have been paying lip service to data integration for years. But behind all the smoke and mirrors, it’s still not a reality without extensive and costly customization. At the end of the day, the typical construction project will have one main system of record along with multiple disparate systems, each maintained by other project stakeholders. Additionally, the typical project stakeholder will have three or more systems to update and maintain, depending on how many different projects it may be working on at any given time. This creates an enormous productivity drain, costly errors, inconsistencies and increased risk.

**Companies Forced to Adapt to the Software**
The second major impediment the industry is facing is that online collaboration systems are not designed to adapt to an organization's business processes. Most software packages are essentially a blend of industry best practices and customer requests. However, by trying to please everyone, these systems end up pleasing no one completely. This creates an enormous amount of inefficiency, and it invariably leads to costly and error-prone manual workarounds and process bottlenecks.

Until recently, users accepted their systems’ inflexibility as an inconvenient reality. But the rapid improvements in design and ease of use of consumer software and mobile apps are creating a new set of expectations among consumers who also use technology in their jobs. It is making them question why their enterprise software can’t adapt to their unique needs like their consumer apps can.

Unfortunately, until recently, the options for the business were limited. Companies could either pay to customize the system, or they could submit a feature request and wait for the vendor to eventually make the changes in a future version.
Customization is often cost-prohibitive. Plus, it adds a new level of risk and complexity to the organization using the system. Software patches, updates and upgrades don’t always work well with the customized system. In fact, a recent report from Forrester revealed that difficult upgrades are the second-biggest challenge organizations face with enterprise software. Eighty-seven percent cited upgrades as either a "significant" or a "very significant" business problem.\(^3\)

As a result, more and more organizations are opting to either keep their system in a "plain vanilla" state of zero customizations or are limiting the technology they deploy every year because of its steep learning curve or its high implementation and customization costs and complexity.

**Inability to Extend Key Functionality to the Field**

The third fundamental obstacle to solving the collaboration challenge is the inability to extend key productivity tools and functionality to the field via mobile technology. Mobile computing has finally reached its long-awaited tipping point. Tablets and smartphones can now deliver a near-desktop experience at an affordable price, and tablets in particular are quickly moving past being a consumer novelty to becoming a serious business productivity tool.

Sales of mobile devices have skyrocketed as a result of this shift. Tablet sales alone are expected to reach 326.3 million units by the end of 2015. Additionally, Gartner expects that by 2014, mobile devices will surpass the total installed base of all PC systems.\(^4\)

For many construction organizations, tablets are rapidly becoming the field-level standard for documenting projects, punch-listing, quality assurance and commissioning. In many cases, adoption of these devices is being driven by the employees themselves as they bring their own personal devices to work, often circumventing IT policies and controls.

Yet despite the rapid adoption of these devices on jobsites, mobile applications for this industry haven’t even begun to approach their full potential. Interoperability challenges, the inability to extend application functionality to these devices and a shortage of practical field-level applications are preventing the industry from truly capitalizing on this game-changing technology. Even Apple’s own developers have acknowledged the current mobile application gap in the construction industry.\(^5\)

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Recognizing the significant advantages of deploying mobile technology in the field, many firms are attempting to fill the gap by developing their own field applications (apps) in-house or through third-party developers. However, development costs can easily top $30,000 for a single app, and compatibility issues with existing enterprise systems are inevitable, especially as systems are upgraded or patched over time.

**Explosion of Point Solutions to Solve Specific Challenges**

Finally, there is the challenge of managing an ever-increasing number of systems and devices with limited IT staff and resources. This past decade has seen an explosion in the number of point solutions entering the market. Software companies, both new and established, have released hundreds of niche applications to address very specific challenges in the design, engineering and construction industry—everything from punchlist management to submittals tracking, pay application automation, drawing management, scheduling and more.

Overall, users have benefited from more specialized solutions. But IT departments have also been overwhelmed by requests for these applications and their inability to manage and maintain such a wide array of software. Adding to this challenge is the fact that industry professionals are adopting tablets and smartphones (often at their own expense) to improve their productivity while on the go, despite the shortage of practical industry-focused apps. This too is creating a serious challenge for IT professionals who now have to manage multiple devices, new platforms and new security issues.

**The Perfect Storm**

The confluence of these fundamental challenges—the unresolved data ownership issue, the continued inflexibility of construction software, the inability to extend key functionality to the field effectively, and the unprecedented growth of point solutions and mobile devices—is creating a perfect storm for the industry. It’s preventing organizations from achieving the level of collaboration required to drive massive efficiency improvements and to reduce risk.

During the construction boom years, much of this inefficiency could be swept under the rug or go unaddressed. That’s no longer an option. Firms are facing one of the most challenging construction environments in decades. They are being forced to do more with less, which means that maintaining multiple non-integrated systems—each with its unique user interface—in multiple projects is no longer viable.

Neither is forcing users to adapt their business processes to a software system or expecting field personnel to stick to inefficient paper-based processes or disjointed and inefficient field applications.
However, this is not just a productivity issue. Poor collaboration also prevents decision makers from having a holistic view of projects and programs. It continues to create unnecessary risk and leads to unacceptable project delays, cost overruns and disputes.

**A Better Way of Addressing the Age-Old Collaboration Problem**

Unfortunately, the engineering and construction software industry continues to address this problem by simply adding more features and functions on top of existing systems, or by introducing even more point solutions or niche software applications. Yet instead of solving the fundamental problem, this bells-and-whistles approach only adds more complexity to applications that, at their core, aren't built to overcome their biggest limitations.

Firms are tired of buying features and functions from their software vendors. Leading organizations are starting to recognize that this environment requires much more than a Band-Aid approach to the age-old collaboration problem. What they want is a platform that finally delivers on the full promise of collaboration technology. They want a software platform that easily adapts to their specific business processes and user needs rather than forcing users to adapt to the software. And they want a platform that solves the data ownership issue and enables them to extend critical functionality to the field easily and cost-effectively.

Fortunately, the same economic conditions that have forever changed the construction landscape have also transformed the software industry, leading to massive innovations in the way software is developed, packaged and sold. One of the most significant of these new developments has been the emergence of B2B collaboration platforms.

B2B collaboration platforms represent the biggest technological shift in the design and construction industry since the emergence of web-based project collaboration tools in the late 1990s. Often referred to as the "holy grail" of collaboration by some industry insiders and early adopters, this game-changing software technology is finally solving the industry's core collaboration challenge by:

- Enabling independent project stakeholders to own and control their independent data and business processes while securely and seamlessly sharing this information with other project stakeholders
- Providing the foundation and tools for the rapid and cost-effective creation of custom applications that conform to users' business processes without negatively impacting other project stakeholders
- Extending applications to mobile devices by providing the fundamental connections to the devices
Enabling data and information to transcend the design, construction and operations lifecycle

The remainder of this white paper discusses each of these points in more detail.

**Solve the Data Ownership Issue**

By seamlessly connecting multiple stakeholders, these B2B collaboration platforms remove a tremendous amount of redundancy and cost. They enable different stakeholders in a project to manage and control their own applications and data, without the need to adopt yet another stand-alone system.

For instance, communications created by the designers are automatically sent to the corresponding parties, regardless of how those parties have configured their platforms or which applications they are running internally. Responses sent back to the designers automatically populate that firm’s database—again, regardless of how that firm has configured its platform, what business processes it employs or what applications it is running internally.

This application- and process-agnostic approach allows organizations to connect worldwide in a truly collaborative environment. It enables easy consumption and dispersion of data to all departments, clients and business partners, resulting in:

- Increased productivity
- Reduced operational costs
- Lower risk and improved regulatory compliance
- Greater visibility and control
- Enhanced agility

Furthermore, because of their open architecture and application programming interfaces (APIs), B2B collaboration platforms facilitate integration with enterprise systems and in-house applications. They enable organizations to seamlessly move their data across applications, departments, phases and companies.

**Enable Rapid and Cost-Effective Custom Application Development**

B2B collaboration platforms also allow every project stakeholder to drastically reduce its technology infrastructure costs. Because these platforms provide each organization with the fundamental components used in virtually all software applications—critical pieces such as reporting, search, workflow, messaging, collaboration, permissions, security, authentication, user interface, file management and many other similar utilities—companies no longer have to pay for core technology every time they need to add new functionality or to develop a new application. Plus, they can create custom applications in just a fraction of the standard time required to develop a fully functioning application.
Moreover, by standardizing on one common platform, all applications share a common user interface, navigation experience and underlying database, which reduces the user learning curve and further shortens time to value. Drag-and-drop functionality and visual process tools and wizards allow business users with little—or even zero—coding experience to build their own point applications quickly and easily.

This kind of open and flexible architecture makes lengthy and costly implementations a thing of the past. It means that users no longer have to conform to the way their software is designed. Organizations can now create custom applications that solve imminent and specific needs and are based on their unique workflows and business processes.

**Foster Innovation and Reduce Software Costs**

It’s not difficult to see how this level of open architecture fosters unprecedented innovation in the construction software industry. The ease of developing and enabling practical applications and business processes that leverage the same database promotes a large network of third-party developers and companies that work together to solve the biggest needs of the industry. This is an industry network that is orders of magnitude greater than the development team of a traditional software vendor.

This alone makes these platforms extremely scalable and efficient for every organization using them. The fact that a company no longer has to settle for a cookie-cutter system or wait for the software vendor to develop specific functionality is a tremendous benefit. It means that each organization can create (or source) the specific applications it needs, building only the level of detail and complexity necessary to meet its own needs.

Additionally, with a marketplace provided for these applications through an online app store, organizations have access to multiple sources of affordable niche tools and applications that run on the same B2B collaboration platform and employ a common user interface.

**Extend Key Functionality to the Field**

Few industries stand to benefit as much from the recent advancements in mobile technology as the engineering and construction industry. Mobile devices have the potential to help field personnel dramatically improve productivity, reduce errors and mitigate risk by speeding up communications, getting faster client approvals, completing inspections and managing logistics much more effectively.
B2B collaboration platforms are the key to extending this functionality to the field by providing the fundamental connections to these devices. Because the platform maintains the same database, regardless of whether information is entered or accessed via a mobile device or a desktop or laptop computer, users don’t have to reenter information into a system once they get back into the office. This not only saves a tremendous amount of time, but it also prevents costly errors and discrepancies.

Furthermore, because it is possible and cost-effective for organizations to buy—or even develop—mobile applications to meet their own unique needs and facilitate specific workflows, organizations don’t have to resort to costly and non-integrated point solutions. For instance, when a company develops a custom PC application through its B2B collaboration platform, a mobile version of that application is automatically created. The only additional steps required to make the mobile version fully functional are simple changes to screen layouts.

**Allow Information to Transcend the Design, Construction and Operations Lifecycle**

Finally, B2B collaboration platforms allow project and program information to transcend the design, construction and operations lifecycle. With all project information kept in one database, that information can easily flow from one phase of the project to the next, without disruption and in a format that is completely "consumable" by each stakeholder’s specific applications, regardless of how these applications are configured or their level of complexity.

For instance, submittals can move from the design phase to construction and from construction to facilities management. At each phase of the project, stakeholders can extract only the relevant information they need from these submittals—and in the format they need it.

In fact, the engineers, contractors or facilities manager could even buy or create an "owner's manual" or "handover" application that automatically consolidates all relevant information on the facility’s major equipment, including specifications, maintenance schedules, part numbers and more. The productivity savings alone would be significant, as would the cost savings from having properly maintained equipment, for example—all as a result of having access to accurate information at the point of need.

**A Game-Changing Technology Paradigm**

To survive and thrive today, project owners and engineering and construction firms need a platform that finally delivers on the full promise of collaboration technology—a software platform that easily adapts to their business processes and user needs, solves the data ownership issue, fosters innovation and reduces
software costs, and enables them to extend critical functionality to the field easily and cost-effectively.

B2B collaboration platforms hold the key to breaking traditional information silos; improving project communication; and removing redundancies, costs and risks from the design, construction and operations processes.

**About Kahua**

Kahua is the first cloud-based collaboration platform to deliver on the full promise of business-to-business collaboration. Kahua enables each party to create, manage and control its own independent applications and data. This allows organizations to connect worldwide in a collaborative environment that enables easy consumption and exchange of data from app to app, phase to phase and company to company. To learn more, visit www.kahua.com or contact us at 770.641.9994.

**About the Authors**

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