Break Free From the Iron Triangle

Use the Power of a Software Platform to Manage the Three Cornerstones of Project Management: Time, Cost, and Quality

PROCORE

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I. The Time-Cost-Quality Balancing Act: AKA The Binding Iron Triangle

It's time for the shackles to come off, don't you think? The truth is, you have the power, and it lies in cloud-based software platforms.

THE IRON TRIANGLE—OR, AS IT IS MORE COMMONLY KNOWN, THE PROJECT MANAGEMENT TRIANGLE—HAS INFLUENCED PROJECT TEAMS FOR YEARS.

Summed up as "fast, good or cheap … pick two," the concept asserts that there are firm boundaries on what is possible to produce. The triangle metaphor implies there is no way to provide goods or services that are simultaneously on budget, on time, and of high quality because of the competing nature of these priorities.

It's time to rethink that notion because now the latest developments in software enable you to do just that. But not in the way you might imagine—with countless software applications required to run different aspects of your project. It's no longer a game of software juggling. The future beyond the Iron Triangle lies in how products and programs work together, in one place, with constant updates that enable teams instead of disabling your IT department. The future is more promising than ever because it's about working together—not apart.

II. Construction Times They Are A-Changin'

You know project management problems intimately. Project teams can only excel if they are able to organize their work and manage the three cornerstones of project management: time, cost, and quality.

There is often limited time available to complete a project, tight funding, and quality is constrained to what must be done to produce a usable and safe space at the project's end.

Various software solutions have been used by construction companies to help meet these critical demands, with particular success in using them to manage the demands of time and budget. When implemented, companies gained efficiencies and their businesses prospered. But for many, forward momentum has slowed. And for good reason. Singular software solutions have inherent limitations. Without the free flow of data, the back-and-forth collaboration to manage the three vertices of the Iron Triangle, how can project teams deliver quality projects on time and within budget? They can't. But technology is nudging us forward and solutions are evolving to meet current needs.

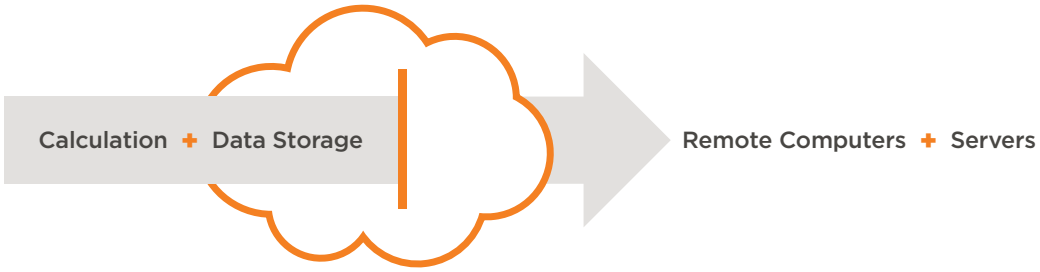
HERE'S WHAT THE FUTURE LOOKS LIKE, AND IT'S LESS CONSTRAINING THAN BEFORE...

III. What Can The Cloud Do For Me?

The cloud provides you with technology to set your company free.
In the past, you were forced to deal with time-sinks with poor technology that wasn't scalable.

For example:

- Standalone computing—desktop or laptop computers that can be used on their own without requiring a connection to a local area network (LAN) or wide area network (WAN)—is difficult to scale.
- Ever-larger files and growing data sets push storage and memory beyond capacity, and transferring information between multiple office locations can present severe challenges.
- Even though in-house networks and the Internet have become standard ways to connect computers, routine chores like data backup, software upgrades, and software customization can become time consuming.



But today's technology solutions are changing the game. The cloud can transfer the "heavy lifting" of calculation and data storage to remote computers and servers that are considerably faster and more powerful than stand-alone computers or companies' internal networks. They are not as costly to install and maintain as software requiring on-premise installation and in-house upkeep and maintenance.

IV. What If Solutions Worked Together, Even If They Were Built Apart?

Consistency is important in construction. Heck, it's important in business success. Period.

And construction companies have sought after building "the" solution to answer the needs of various internal departments—but the results haven't exactly been perfect. You are probably familiar with the ins and outs of the software juggling game. It's common for computers to house multiple business-related software applications: one for estimating, one for billing, and so on. And as the software applications multiply, so do companies' office and field routines. **Would you even want to count how many times in a given day you open a program and then copy and paste some of its contents into another program?**

To correct the situation, many companies have invested an exorbitant amount of money and resources in a multifunctional enterprise resource planning (ERP) system offered by one vendor (single source).

RISKY. HERE'S WHY.

Purchasing software packages designed to "do it all" from one vendor may lack customization and add-on options, and in the end, may not be enough to provide a perfect fit for each department's or industry's specific needs. Many business owners end up spending even more money to purchase additional software to address unmet needs. If that's not frustrating enough, new applications aren't always built to connect well with the system you already have in place.

V. Can Your IT Needs Catch A Break?

It may seem like the purchasing of various software packages, and the barriers that end up existing between those packages, are inevitable.

With each program tailored to meet a specific need, and each one the proprietary product of an individual company, it's not intuitive that the programs would ever be able to interface.

IT'S TIME TO RETHINK THAT.

Systems are emerging that break down these barriers, allowing data transfer—and, consequently, project management—to become easier. Known as software ecosystems, they consist of multiple interacting parts and are rich with plug-in and add-on products that can be customized to an application's functionality. It should be noted that most software vendors do not offer an individual solution that includes everything you need. However, savvy software providers do take advantage of open application programming interfaces (APIs) and integrated software ecosystems that allows users to connect to the functions and data they need in another application.

This shift toward software ecosystems allows construction managers to have all potential tools available to them, whether they are in the office or in the field.

VI. United Projects Stand—Divided, They Fail

The applications that we've become accustomed to installing on our personal computers are "single point" solutions: they typically perform only one type of task.

1. **Redundant. Repetitive.**
   Fuel inconsistent data entry.
2. **Behind.**
   They don't allow for real time data entry in the field.
3. **Time-consuming.**
   Excessive training and support are often required across multiple software solutions.
4. **Challenging.**
   Software upgrades, compatibility, and version control are major challenges.
5. **Outdated.**
   Large data sets are in legacy "silos," so their value can't be leveraged. (Legacy systems are those programs or computer languages that are no longer kept current and are potentially outdated.)
6. **Incompatible.**
   Data backup and maintenance is complicated due to incompatible data formats.
7. **Difficult.**
   Development of custom, business-specific features is difficult (and costly).

With all the problems that come with point solutions, technology has turned to platform as a service (PaaS).

VII. What's The Difference Between SaaS And PaaS?

Platform as a service (PaaS) is a cloud computing model that delivers applications over the Internet.

In a PaaS model, a cloud provider delivers hardware and software tools—usually those needed for application development—to its users as a service. A PaaS provider hosts the hardware and software on its own infrastructure. As a result, PaaS frees users from having to install in-house hardware and software to develop or run a new application.

WHAT DOES IT DO?

PaaS offers a proven way to make separate software solutions work together by providing common interfaces, automatic data transfer, and faster development of custom features.

It directly addresses all these challenges by reducing training and support costs, sharply reducing data entry time while eliminating transcription errors, and facilitating enterprise-wide use of acquired data and knowledge.

In the construction industry, PaaS can be used to integrate solutions as varied as project management, tenders and estimation, quantity calculations, and accounting.

SO WHAT?

The benefits of implementing PaaS expands synergistically as data flow is extended to more and more existing software solutions. When all information—plan sets, tenders, hours, subcontractor fees, project milestones, deficiency lists, change orders, etc.—lives in a single, cohesive environment from

project inception through closeout, contractors can realize massive efficiency gains and cost savings.

Providing high-quality information derived from multiple software solutions that were previously in their own “silos” can make client communication more efficient, reduce the need for change orders (while also making change orders more understandable and evidence-based), and give them greater insight into construction progress and unavoidable delays.

In pre-construction phases, an update on quantities of earth moved, compared to total expected quantities per phase, gives clients a satisfying measure of progress in a previously ambiguous area. This raises their confidence level in the contractor’s progress, and gives them a sense of what they’re being billed for.

SAVE TIME. SAVE MONEY. SAVE YOURSELF THE RISK OF QUALITY PROBLEMS.

Plan Sets
Tenders
Quantities
Hours
Subcontractor Fees
Project Milestones
Deficiency Lists
Change Orders
Etc.

VIII. What Do Platforms Have To Do With The Iron Triangle?

Savings. Legacy and point technologies ultimately end up costing you more. Whether the currency is time, money, or reputation, the problem with solutions that can't support all your project managements needs is that you end up spending and wasting more.

Save Time in the Field

VERSION CONTROL

Cloud-based software solves the problem of drawing inaccuracies. New sets of drawings are tracked automatically and the entire change history is available allowing team members to see exactly what has changed across versions along with who made those changes.

TRACKING & ARCHIVING

When two documents are related, those relationships can be tracked and archived in the software. For example, an RFI can be attached to a drawing, or a photo can be attached to a deficiency list item.

DIAGNOSE PROBLEMS AS THEY ARISE

Every project document can be accessed using any Internet-connected device from any location. Users can create, review, and share project data from any location and monitor deadlines and anticipate delays in permitting, inspection, or obtaining equipment as they occur.

INSTANT INFORMATION RETRIEVAL

Bringing the power of search functionality to project documentation results in a much more efficient system (rather than searching for papers in filing cabinets). Documents can also be distributed more quickly between team members— even those who are remote. Whenever revisions are made to a document, everyone can see them in real time.

Save Time in the Office

NO EXTENDED TRAINING REQUIRED

Some of the biggest time-savers of project management software are automatic byproducts of the system—no extended training required. E-mail chains are automatically preserved and filed, keeping a paper trail at your fingertips. Routing and approvals are expedited throughout your organization, improving turnaround time and reducing miscommunication.

SEE NUMBERS IN REAL TIME

Perhaps the most significant factor is that when you can see numbers in real time, it is easy to instantly form a comprehensive sense of a job's status. Some potential problems can be staved off completely just by having information before it is even realized it's needed.

GAIN EFFICIENCIES

When your project management software is integrated with robust accounting software, it is possible to collect union dues, track overtime, get time approval, and produce certified payroll reports without manually entering the information in a separate software program or having to collect and process paper documents.

TRACK THE DETAILS

The tracking of subcontractor contracts and payments are improved and aggregated into a single location, making it easy to see details such as invoiced amounts exceeding commitment amounts.

STAY COMPLIANT

Subcontractor–and vendor– compliance issues are easily managed. Having immediate access to forms and paperwork allows for tracking and automation of compliance statuses on insurance, lien waivers, etc. In addition, timely e-mail notifications of noncompliance enable swift action, such as withholding payment.

Save Money

Saving time automatically leads to saving money, but cloud-based software also has a direct bearing on project budget.

ONE-CLICK ACCESS TO THE LATEST FINANCIAL DATA

Accounting integrations give project managers control over project budgets, allowing them to track expenses against budgets in real time and accurately forecast project costs. Informed decisions can be made directly from the field and provide better insight into a project's "big picture."

STAY ALERT TO POSSIBLE ISSUES

Easy access to cost information can also alert personnel to possible problem areas. Costs that are unexpected or don't match the original estimate may be a red flag for a systemic problem. When personnel are able to easily compare related data, issues can be spotted early on.

STREAMLINE INFORMATION FLOW

Streamlining the flow of information using cloud-based software also improves a project's timeline and budget by fostering adherence to original plans and drawings. The construction phase of a project is not the time for creative planning. While much value-engineering and cost savings can be accomplished during a project's pre-construction phase, once construction is underway, the goal is to adhere to already established design details because any deviation has the potential to cause delays.

IX. Save Risk From Unsophisticated Quality Management

The notion of quality goes far beyond product refinement and can have life-or-death consequences. More commonly, the costs associated with such mistakes are small. But even these costs, when considered cumulatively, are significant.

ENSURE CONTRACT AND SAFETY REQUIREMENTS ARE MET

A quality control (QC) program can help drive the success of construction projects by ensuring contract and safety requirements are met—and work is done right the first time. For general contractors tasked with QC responsibilities, this means making sure the project is built to plan, specifications, industry and safety standards, and requirements set by the architect, engineer, and owner. Typically part of a project-specific Quality Assurance and Quality Control (QA/QC) plan, QC relies heavily on inspections during all phases of construction. When superintendents, project managers, and/or dedicated QC staff follow a rigorous field inspection schedule and daily safety checks, they can identify problems and take measures to correct any oversights before they lead to more expensive—or dangerous—issues.

BENCHMARK QUALITY THROUGHOUT CONSTRUCTION

Whereas a QA plan is part of early-stage project planning to lay the groundwork and formulate processes that will lead to the best outcomes, QC activities occur throughout the project to determine whether the results of completed work meet criteria outlined in the QA plan. In addition to inspections of all types, QC includes conducting audits—based on metrics that have been established early in the project's front-end planning—to aggressively benchmark quality throughout construction. Maintaining an ongoing list of corrective items that must be accomplished before the responsible subcontractor is paid or leaves the job is also essential. It all boils down to identifying issues as they happen, and addressing them before they become bigger problems that could impact the project deadline and budget, your reputation, and—most importantly—the safety of job site workers and end users.

RECORD EVERYTHING

The key to QC is performing good inspections with thorough record-keeping. This means putting everything in writing. Keeping logs of inspections with project photos as evidence is critical to building the documentation that can help resolve issues or protect your firm during litigation. Construction firms are turning to mobile, cloud-based software to digitize their QC activities, establishing standard processes to create and fill out forms, track inspections, and notify responsible contractors—all from the job site, using tablets and smartphones. With QC records in the cloud, nothing gets lost or erased. This means project team members can track any project's history to see what quality control measures were taken, when they were performed, and by whom. All data is exportable; the software makes it easy to create PDF files or other document formats as needed.

PROTECT YOUR QUALITY REPUTATION

Everyone understands the inherent benefits of quality. But there is also value in communicating to your customers that you are a quality company, with a history of performing quality work and keeping your workers safe. Small companies are increasingly educating themselves on the importance of QA/QC and adopting relevant workflows. Larger firms now sometimes employ several dedicated QA/QC personnel. Because providing higher levels of quality to customers is now possible, it is becoming a differentiator in the marketplace.

X. Your QA/QC Process Checklist

Take the quality challenge.

With your project management solution, can you:

- Easily retrieve forms and templates from the cloud so remote team members can access them from wherever they are?
- Create inspection checklist forms and use them to thoroughly and accurately report the quality conditions of any given project?
- Ensure the right questions are being asked, and the right steps taken, in every situation?
- Easily update the templates over time to keep project portfolios current with evolving quality-management processes?
- Quickly respond to inspection questions on the job site with a simple “yes,” “no,” or “not applicable” inspection checklist?
- Access project specifications from any Internet-connected device?
- Digitally capture, save, and share deficient inspection items with supporting comments, and attachments so action can be taken and responsible contractors notified automatically?
- Take photos, mark them up, and link them directly to a checklist item, using the same device that is being used to access the checklist?
- Immediately share inspection findings with appropriate parties who have the right permission access to make decisions and move the project forward rather than wait for vital project information?
- Identify and track nonconforming items as solutions are implemented?
- Automatically link digital entries to data regarding who took a given photo, who inserted a particular comment, etc., for increased accountability?
- Time stamp entries, further enhancing the completeness of your log?
- Create faster closeouts?

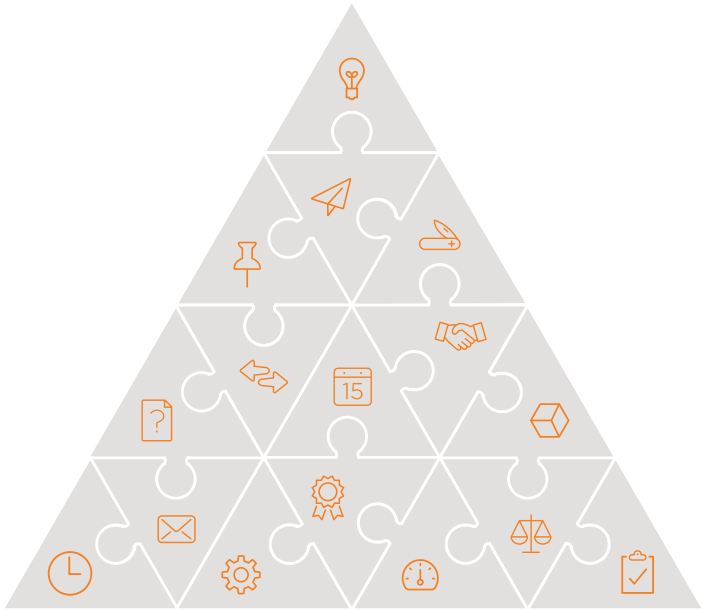
The benefits of these capabilities can be seen in other aspects of a cloud-based project management solution, including a reduction in deficiency list items (since standardized inspections are resulting in more efficient problem resolution), and less training and implementation with consistent, repeatable processes in place. Plus, the ability to have all photographs present, organized, and linked to the digital drawing set at the end of a project simplifies commissioning and closeout.

XI. All The Pieces Are Built Into One Place

With the addition of quality control and inspection tools, best-in-class project management software solutions are encompassing the three corners of the project management triangle like never before.

If your project management system does not make day-to-day tasks simpler, improve overall project speed and accuracy, and result in a holistic, beginning-to-end quality control solution, there is a very real risk that you will not be able to keep pace with your competition.

STAY AHEAD. ASK US HOW.



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