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Successful Construction Project Collaboration: The Owners and Contractors Guide

Learn how six key best practices can strengthen project information management and collaboration



Table of contents

Break down barriers to effective project collaboration 3
Six best practices to strengthen project information management and collaboration 4
Best practice 1: Establish a reliable single source of truth for project information, so all teams can confidently work together 4
Best practice 2: Make it easy for collaborating project teams to find the right information when they need it 7
Best practice 3: Define and enforce the processes teams will use to manage information and collaborate 10
Best practice 4: Organize information into work packages 11
Best practice 5: Don't rely on email for contractual project communications 12
Best practice 6: Bolster confidence across teams with an iron-clad audit trail that provides traceability and accountability 12
Bringing best practices to your organization 14

Break down barriers to effective project collaboration

Modern project delivery depends on keeping everyone aligned on the same facts. With so many organizations, people, processes, and documents involved in delivering a project, a single missed handoff, buried document, or delayed decision can cascade into costly rework and schedule slip. Effective contractual collaboration and communication helps ensure the project is completed safely, on time, and within budget while also minimizing the risks of errors, delays, and disputes. But project teams today face numerous challenges that stand in the way of effective project collaboration.

Ongoing industry challenges for construction and engineering project owners and contractors

- Project teams include many organizations, people, processes, and data that all need to be coordinated and managed.
- Change is constant in project environments and can negatively impact the entire project team, schedule, and associated costs.
- Risk exposure can exist across an entire project, including onsite safety, schedule slippage, cost blowouts, collaboration issues contributing to mistakes and rework, disputes and litigation, and security and project information risks. Poorly managed project communications could potentially worsen other project risks.
- Project data is disconnected and siloed. Information is often scattered across multiple locations and systems, such as offline spreadsheets, making it difficult to effectively track and manage.
- Organizations are under continuous pressure to improve job performance, productivity, project execution, and profit margins.

Untangle project complexities

These ongoing industry challenges can create a matrix of complexities for construction and engineering projects, making it unnecessarily difficult to efficiently track and manage projects. In this guide, we'll unpack the six best practices project owners, contractors, and other stakeholders can implement to strengthen project collaboration and information management so projects can be successfully delivered.

Six best practices to strengthen project information management and collaboration

Best practice 1: Establish a reliable single source of truth for project information, so all teams can confidently work together

A project can easily become difficult to manage if the multiple organizations working on that project are using different systems to communicate, issue and track documents, and complete collaborative tasks. Traditional approaches where teams communicate via email and manage documents and information in their own systems make it difficult to maintain document version control.

Even simple projects can generate thousands of documents while larger, more complex undertakings can produce hundreds of thousands or even millions of documents. As multiple versions of documents get exchanged across different project systems, collaborators run the risk of working from incorrect versions of documents, which can give rise to confusion and errors that jeopardize project timelines and budgets or put it at risk of a legal dispute.

The solution? Establish a reliable single source of truth for project information with a secure, centralized system that everyone on the project can use for collaboration. With the right information governance in place, this approach allows everyone to see and work from the same project data and the correct versions of documents.

Project collaboration is *contractual* collaboration

- ✓ **On any given project, there are many contractual commitments between different organizations. The ability to easily manage and track contractual commitments and communications is critical for effective project collaboration—and for project risk mitigation.**

  For example, the owner may have contracts with an engineer, design firm, and general contractor, all of which will, in turn, have contracts with various subcontractors and suppliers. All these contractual commitments need to be documented, and any related correspondence and actions needs to be recorded, tracked, and easily found. Good information management practice dictates that related documents and drawings be linked to the contract, and that a project management system support this approach.

- ✓ **In the physical world, contracts are only distributed between the parties involved; this is how a project system managing contractual collaboration needs to work as well. But with some systems, the owning organization controls who can access and manage project documents, which creates predictable delivery, risk, and compliance issues.**
- ✓ **A project management system should provide each organization with their own private workspace that they control, with the ability to distribute and issue information as required. In addition, it should support permanent, reliable, and well-organized contractual communications.**
- ✓ **A centralized project system becomes essential when delivery depends on a shifting ecosystem of designers, contractors, and suppliers. Teams expand and contract, roles change hands, and people rotate on and off before projects are completed.**
- ✓ **Each team may include different stakeholders with unique project requirements who may have their own preferred approaches for communicating and collaborating. Furthermore, team members across different organizations may not always trust one another or may not trust they'll get the most accurate information when they need it. This lack of trust can often prompt team members to maintain separate records using their own systems outside the established centralized project system.**

A by-the-numbers example of construction and engineering project teams and information

200	Organizations, including a range of companies and departments within companies.
2,000	Users across those 200 organizations with varying skill sets.
1 million	Documents, forms, and designs that need to be tracked and completed correctly.

Source: Oracle

The single source of truth can accommodate team changes while helping to increase project efficiencies and minimize errors. This approach should also support the creation of a complete and *reliable* project record, because one mistake can cost millions or put someone's safety in jeopardy. When a project is completed, the project record can help the stakeholders complete post-project handover, verify information and contractual communications if a legal dispute arises, and support post-project analysis to help identify improvements and best practices for future projects.

Although the benefits of a centralized system are well understood, participants may still remain skeptical about having true control of their project data. Central to this wariness is concern that others—including the organization that owns the system—can alter data or lock out another participating organization.



Build trust across collaborators with a level playing field

- ✓ **To foster the trust needed for effective collaboration and information management, a centralized system should afford each participant true ownership and control over their own project data.**
- ✓ **Project collaborators may assume the work and information affiliated with their organization belongs to them. But realistically, most project information management tools give one user or organization ultimate system administrator permissions—and it's typically the one paying for the system.**
- ✓ **The "super admin" user may have authority to override anyone's access to the project system (and their data) or to alter data and records on the system. This can be particularly compromising if a dispute or litigation were to take place.**
- ✓ **Given these concerns, organizations selecting a system to manage project collaboration and information management should assess what kinds of data protections each system affords. One that assures true data ownership for all participating organizations—where no single organization is favored—will go a long way toward building trust in the system across project participants. In addition, a project collaboration system should ensure that the project record is underpinned by a reliable record that gives teams confidence in the integrity of their—and all other teams'—information on the system.**
- ✓ **Such an approach builds trust, creating a single source of truth where project information is exchanged and teams stay connected.**

Best practice 2: Make it easy for collaborating project teams to find the right information when they need it

Once everyone on a project is using the centralized system, it's important they can easily find the right project information when they need it.

Finding information online is easy. Just type a word or phrase into a search engine. That same level of convenience should be applied to construction projects.

How information is managed and stored is critical here. While technology has helped enable big improvements in project information management, many systems still function like glorified digital filing cabinets. The paper-based folders of old may be gone, but the complexity of a folder-based approach remains, especially when you consider that in many cases, all project organizations are maintaining their own large paper filing cabinets alongside the project system's complicated storage architecture. So it's easy to see how document version management can quickly spin out of control, with multiple duplicate versions and revisions of documents being handled and stored across project teams.

Yet, project teams must be able to make confident decisions. That requires one current version of a document that teams can rely on, with all previous versions of that associated with the current version and stored in the system's record.

So how can projects move from this disordered state to one where the right information is readily available? Instead of rifling through a digital filing cabinet, teams need to access a search engine, which also means having the right metadata (or characteristics) associated with project document/information for fast and accurate retrieval.

Disparate project systems may compel project teams to maintain complex folder structures that don't provide any type of search input or filtering capability. When teams can't quickly find—and trust—the latest version of a document, drawing, or model, decisions get made with outdated information, triggering rework, delays, and avoidable cost. Having a centralized system that offers a familiar search-based approach using metadata minimizes chaos and helps project collaborators more easily retrieve the right information.

Industry example: Finding RFI information using search capabilities

- ✓ **RFIs are high-volume, critical project communications with contractual ramifications that have significant impacts on cost and schedule. The details and statuses contained in RFIs are indispensable for controlling risk. Yet often, RFI information is spread across many separate email inboxes in different organizations.**
- ✓ **RFI information might be logged in a spreadsheet, disconnected from project messages shared in the centralized system. This information log is likely maintained by a single project participant, creating a bottleneck and potentially a single point of failure. Bottom line: there's no clear view of an RFI's impact on a project.**
- ✓ **In a centralized system, team members can conduct a search for RFIs associated with a project and filter the search to see specific types of RFIs. Outstanding RFIs or overdue RFIs could be selected filters. The result? Team members can quickly locate current, accurate RFI information.**

Search-based inputs using metadata vs. folder structures: A side-by-side comparison

A search-based approach for finding project information is more efficient than traditional, disjointed folder structures.

Search inputs using metadata	Folder structures
• Help project collaborators retrieve project information faster with simple and familiar search engine functionality. • Allow filtering capabilities so project collaborators can view and access specific document types. • Help project collaborators locate and work from the newest, correct document version.	• Require manual designing and maintaining, and there's no guarantee everyone will adhere to the same structure. • Can cause document version control issues if multiple organizations create multiple folder structures, then share different versions of the same document across those different folders. • Create unnecessary administrative overhead and increase the risk of errors.

Connect models and project information in the one system

- ✓ **Building information modeling (BIM) is becoming more prevalent in construction as the technology becomes more integrated into project and processes management.**
- ✓ **As reliance on models accelerates, good information management dictates that these models and the underlying contractual project communications, documents, and other information should stay fully connected in a project's centralized system. This strengthens design and construction collaboration and gives every participant greater assurance that they are working with accurate, up-to-date information.**

  For example, RFIs and documents can be directly connected to objects in the model, and design issues, such as clashes, can be contextually attached to objects in the model. Teams gain visibility into potential changes as well as the background context. They can easily coordinate and update models, making any necessary changes. Throughout the process, an unalterable record is maintained, setting the team up for successful completion and project handover.

Best practice 3: Define and enforce the processes teams will use to manage information and collaborate

Projects need structured document and design review and approval processes so they can keep moving forward correctly until they're completed.

These reviews can get complicated when multiple people and organizations are trying to communicate back and forth using multiple systems. It can also be unclear what everyone's role and responsibilities are in the review process and what next steps are needed, leading to delays and bottlenecks.

To complete projects successfully, the review processes should be established and enforced in a centralized system so everyone's role is clear and steps can be executed at the right time and in the right order. With the right system in place, enforcement is passive for document managers and administrators; the system ensures processes are followed.

Project administrators can work from customizable templates to map out the right review, approval, and tracking process for documents and designs, so no part of the review process is left unclear. With automation, information can be routed, and collaborators can be instantly notified when it's their turn to review or approve a document or design, minimizing the risk of missing a deadline.

Overall, defining and enforcing project processes takes the guesswork out of the reviews and approvals, helping to increase accuracy and efficiency so projects can be completed on time and within budget while minimizing risk.



Bring review and comment management fully online in the same system as project documents

- ✓ **To properly manage reviews, everyone on the project needs to be able to provide comments directly connected to documents in the centralized system. Typically, when project collaborators provide comments and manage comment reviews, they use offline point solutions or disconnected systems, such as spreadsheets. Project documents are managed separately from the review comments, creating significant administrative overhead and increasing the risks of miscommunication, delays, and errors.**
- ✓ **Bringing comment management online in the centralized system can mitigate these issues. With documents and review comments directly connected, backed by the structure of an automated review matrix, review requirements are appropriately routed, and feedback is seamlessly captured without getting lost or overridden. This can help facilitate review collaboration and a more efficient resolution process.**
- ✓ **Reviewers can also raise problems, questions, and comments as issues directly on the document. Issues can be continually accumulated through each document review cycle then be addressed as needed. Project fields can also be applied to issues so specific feedback can be collected during document reviews.**

Best practice 4: Organize information into work packages

A search-based approach using metadata is only part of the equation to help project collaborators easily find and access the right information when they need it. Project information should also be organized with structured information sets so items from a document register can be grouped together in more meaningful ways.

These information sets, called work packages, can serve as digital envelopes, so project collaborators don't have to search documents one by one in the project's document register.

Over the duration of a project, documents and designs can be added to the work package. Over time, packages can be edited or moved into a structured hierarchy to match work breakdown structures. Work packages assist with critical QA sign-off and can be verified and closed when the work is completed, providing an unalterable record of activity that can be revisited any time.

Best practice 5: Don't rely on email for contractual project communications

It's common for many organizations to default to email for discussing construction projects and sharing important documents. But traditional email is not the right tool for managing contractual communications.

With email, critical project information may get lost or overlooked during routine exchanges between teams or organizations. And when collaborators leave projects, it may be difficult to track their old emails.

Email communications aren't always properly organized. More importantly, using email means critical communications and underlying information are not captured in the single project record and audit trail. Worse still, critical emails can be deleted—or even altered after the fact—which can raise questions about how useful they are during disputes.

Quite simply: if you've got email, you've got risks.

So what should project teams use in lieu of work email for project communications? Project teams should rely on an approach that preserves all project correspondence and organizes all communications in a linear and indelible manner that makes it easy to see how a particular decision was made from start to finish. All correspondence should be managed on the same system as project data, allowing linking of correspondence with information providing additional context where required. This creates accountability across teams, provides confidence that there will be receipts should problems arise, and helps resolve any disputes faster.

Best practice 6: Bolster confidence across teams with an iron-clad audit trail that provides traceability and accountability

As the above discussions make clear, an unalterable audit trail of information and decisions is needed for confident and effective project collaboration. Should a problem or dispute arise, it's crucial that complete records of communications, documents, designs, and all other information are maintained.

Traditional information management approaches and systems can be unreliable during disputes as they don't provide a clear record of what happened on a project, making it difficult to assign accountability. When dealing with many thousands of documents (or more) and myriad communications across numerous organizations, pinpointing exact details regarding a problem can seem nearly impossible if correspondence or documents get deleted or altered or if project records are incomplete, unreliable, or difficult to find.

With an unalterable audit trail, project owners can go back to the system of record to identify what the problem was as well as when and how it arose. The audit trail must reflect what was done and said, when and by whom, and how decisions were reached. Without this level of traceability, it can be difficult to hold project members accountable for their actions if something did go wrong. In addition, auditability is a must in projects that require higher levels of compliance or where regulatory compliance requirements call for additional documentation of records.

By following these six key best practices, construction and engineering teams can build trust across a project and strengthen collaboration.

- ✓ **Best practice 1: Establish a reliable single source of truth for project information, so all teams can confidently work together**
- ✓ **Best practice 2: Make it easy for collaborating project teams to find the right information when they need it**
- ✓ **Best practice 3: Define and enforce the processes teams will use to manage information and collaborate**
- ✓ **Best practice 4: Organize information into work packages**
- ✓ **Best practice 5: Don't rely on email for contractual project communications**
- ✓ **Best practice 6: Bolster confidence across teams with an iron-clad audit trail that provides traceability and accountability**

Bringing best practices to your organization

To put these best practices into practice, project teams can look to Oracle, the industry's trusted source for construction and engineering solutions. With Oracle Aconex, project organizations can securely connect teams, processes, and information across the project lifecycle on one centralized system. Aconex helps power effective collaboration and captures a complete and reliable record of project information, while protecting the data ownership of all participants. Backed by an unalterable audit trail that helps minimize disputes, Aconex helps teams collaborate with confidence from preconstruction and design through construction and handover.

Ready to strengthen project collaboration with Oracle Aconex?

Take a quick tour

Connect with us

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