

# A Beginner's Guide to Connecting Construction Data and Documents

Drive construction site success  
using a common data platform



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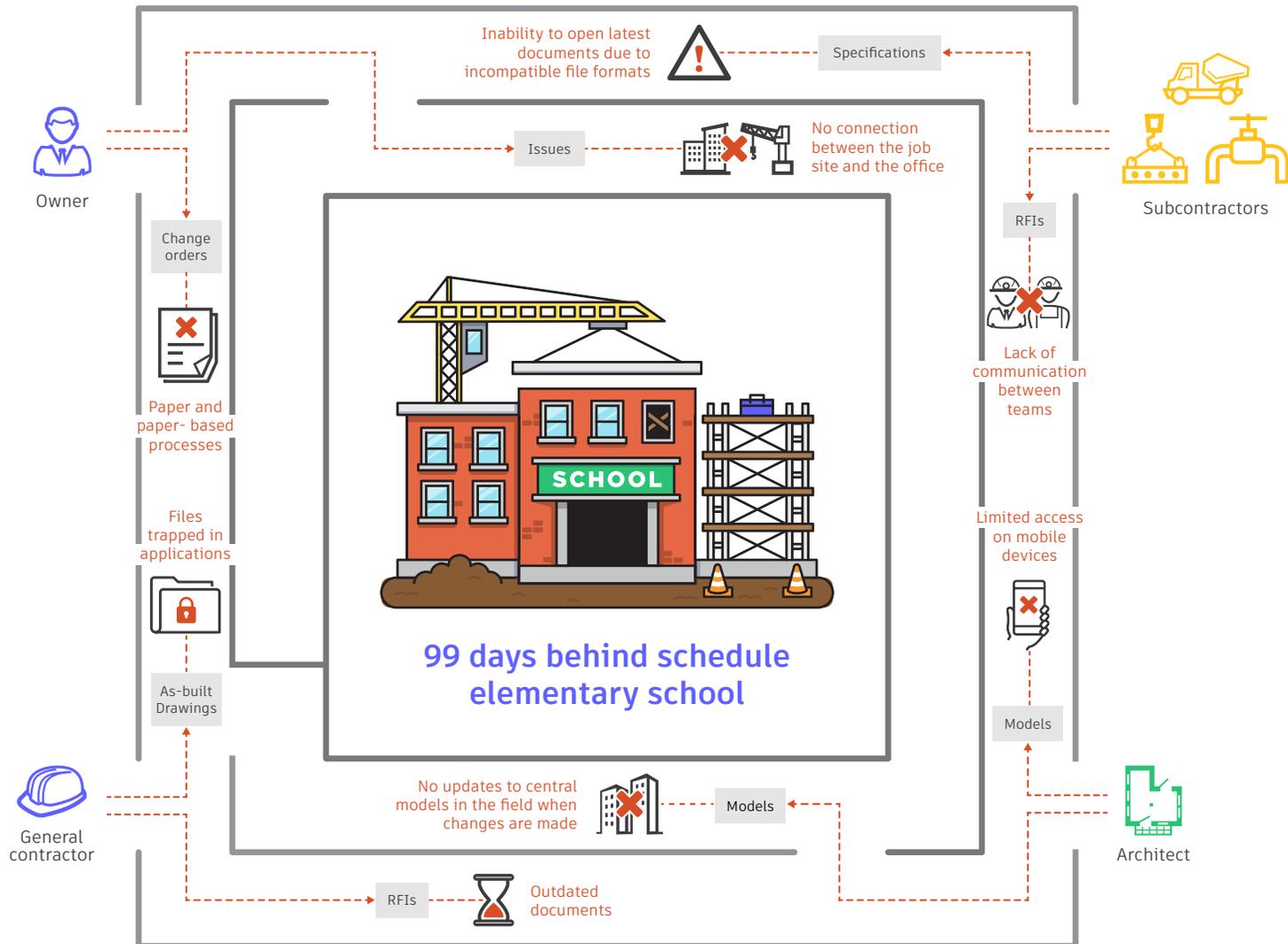
# Introduction

Imagine an elementary school delivered 99 days behind schedule. A hospital renowned for its botched workmanship. A luxury apartment complex completed \$4.6 million over budget. A stadium with more injuries on the job site than on the playing field. When construction projects go smoothly, there's plenty of praise to go around. A project gone awry, however, can become famous for all of the wrong reasons.

Behind every failed construction project is a lack of communication between stakeholders and teams in the field. Contractors and trade specialists often find themselves working with outdated data and plans that are riddled with version control errors. This results in missed deadlines and costly rework. Data silos, disconnected teams, and poor visibility into key project information negatively impact quality in the field, leaving stakeholders pointing fingers and taking blame instead of celebrating a job well done.

Project stakeholders know that mistakes caused by lack of communication cost money and can slow project progress to a crawl. Owners say that design errors and omissions are one of the top concerns affecting project outcomes, and 80% of owners believe these errors are a prime reason for added project costs, according to [McGraw Hill](#).

Today's construction sites are plagued by a lack of communication between teams, leading to missed deadlines, costly rework, and a project that becomes famous for all of the wrong reasons.





Today's project leaders often struggle to successfully integrate and share information and documents from the many stakeholders that generate critical data—and this can create a disconnected construction site. In the trailer or at the office, document managers are overwhelmed by the sheer number of documents being sent to them by architects, designers, developers, subcontractors, city and state officials, and others.

Documents rarely conform to a single naming convention, requiring the document manager to inspect and rename every document before filing it in accordance with his or her organization's file system. The document manager is then required to make sure that all parties on the job site have the information that is most relevant to them. This task is complicated by the fact that many teams do not have access to the file system, forcing the document manager to email individual files or update a separate file repository.

Access to information and documents also has a major impact on superintendents, who can't afford to be tied down to the trailer, and don't have time to navigate difficult-to-use software that isn't designed specifically for the job site.

On the job site, the success of the superintendent is closely linked to how quickly document managers can update documents and make them available to the field. Superintendents need instant access to the latest models in order to mark up and direct work to subcontractors. If the superintendent has the latest models and documents, he or she can quickly resolve issues and reduce the need for RFIs.

Complicating the superintendent's access to information is the fact that 63% of construction professionals rely on manual paper-based processes or spreadsheets instead of digital models.<sup>1</sup> If changes are made by the architect, engineer, or general contractor, field teams find themselves working from outdated plans and making errors that need to be corrected later. To avoid this problem, [49% of construction professionals](#) say they are beginning to move away from paper and are beginning to transfer digital data manually—wasting critical job-site resources on time-consuming manual tasks.

When teams rely on paper-based methods to create issues on the job site, tracking becomes a big challenge. Understanding which issues have been resolved and which still need to be addressed introduces significant complexity. Without a standardized methodology to manage issues, the information exchanged between the document managers and subcontractors is unlikely to be accurate and actionable.

As job sites begin to move beyond paper-based processes, new technologies are being developed for the construction industry to create a connected job site and eliminate version-control issues. However, instead of simplifying the process and improving communication, this glut of technology has its own set of challenges. Too often, the general contractor is using specific software to manage the project while subs are using different software titles that rarely (if ever) integrate. In fact, only 5.9% of contractors say that all of their applications integrate in the field.<sup>1</sup>

This lack of integration increases the likelihood that some teams do not have access to the most up-to-date information they need to efficiently complete tasks. It also creates data-security and access-control risks. If teams are not able to share information via their company's chosen software or application, they're more likely to find "work-arounds," such as unsecured

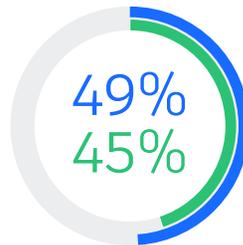
cloud document-storage solutions that do not meet corporate IT security standards. This creates compliance issues, the risk of information loss or theft, and potential legal ramifications if sensitive data falls into the wrong hands.

Whether teams rely on outdated paper-based processes, or opt for digital collaboration and data storage solutions, they continue to run into the same problems.

What if construction teams had timely access to the most up-to-date documents, and you could quickly and easily share them with everyone on your project team? What if you could easily open, mark up, or add comments to plans and models—even if they weren't in your organization's native file formats? What if all stakeholders had access to a unified database of all current documents that could be updated in real time without depending on a document manager?



Only **6%** of contractors say all of their applications integrate in the field—this is one of the industry's biggest problems.<sup>1</sup>



Because applications don't integrate, **49%** of construction professionals say they resort to transferring data manually, and **45%** use spreadsheets.<sup>1</sup>



**63%** of construction professionals rely on either a manual process or spreadsheets to collect data on the job site.<sup>1</sup>



Nearly **50%** of construction pros prepare daily reports manually—a timely process that is prone to errors.<sup>1</sup>



# The value of a common data platform

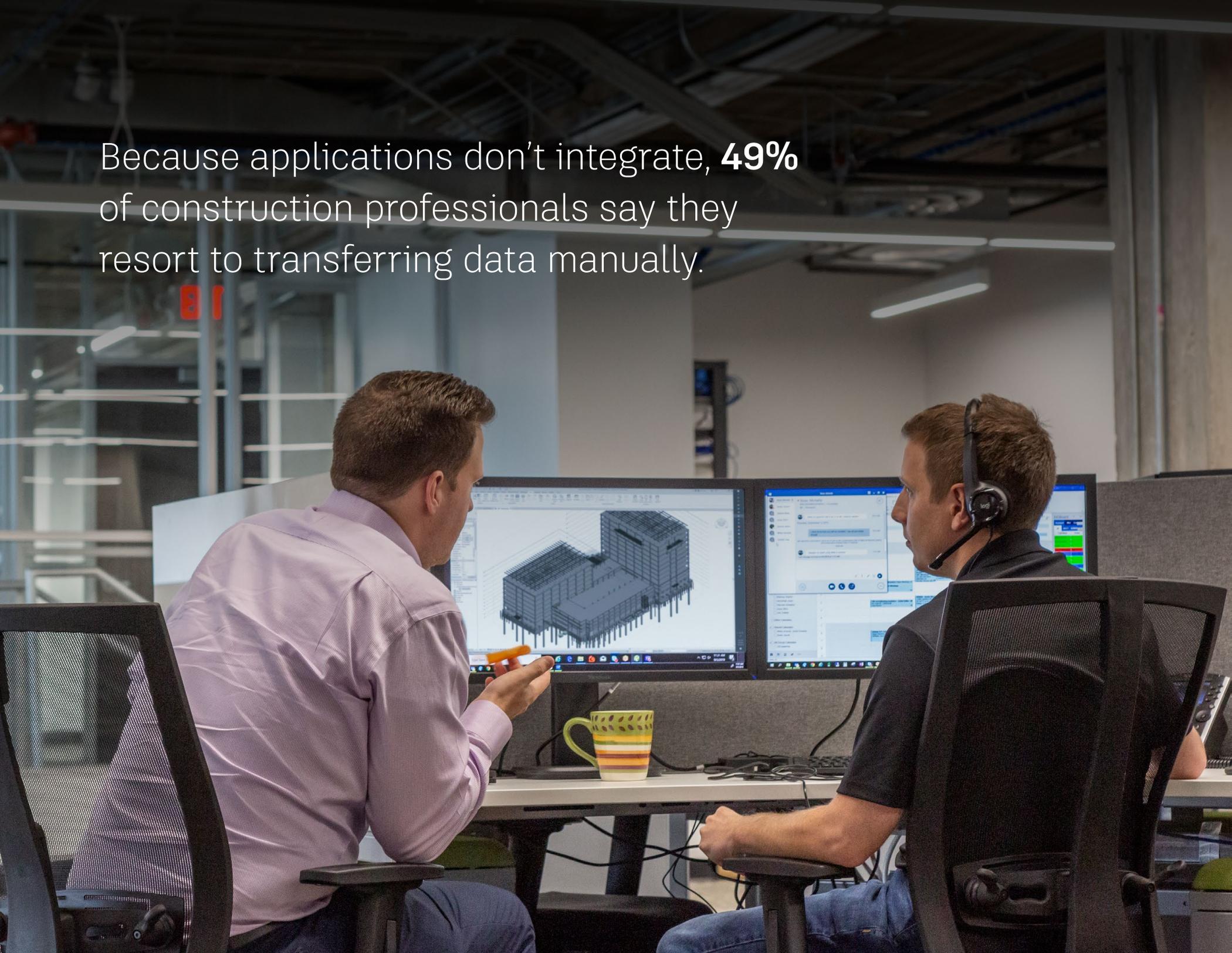
A standard document-management strategy can help multiple stakeholders collaborate effectively. It can also provide confidence that sensitive project data is secure and accessible only to stakeholders that require access.

A common data platform, or CDP, offers a single source of information for a project. The CDP is used to collect, manage, and disseminate all approved project information for multidisciplinary teams. A CDP can use a server, an extranet, or a file-based retrieval system—but no matter where or how the data is stored, it should let information be shared efficiently among all members of an extended project team, and it should work across companies and geographic locations. A cloud-based solution is ideal.

A CDP should include these 4 data management capabilities:

- A shared project workspace for project team members from different disciplines, companies, and locations
- Controlled access to the information stored in the CDP
- A structured, configurable approval process to control the flow of project information
- A process to track and manage activity related to the CDP's information and controls

Because applications don't integrate, **49%** of construction professionals say they resort to transferring data manually.





# The value of working from the same documents

Wrong and outdated versions of documents—combined with a lack of visibility into which issues have been resolved and which are still outstanding—are some of the common problems that crop up when there isn't a single unified source to manage project documentation.

A cloud-based construction-specific management system can provide the common data platform needed for projects to proceed on time, on budget, and without errors—using approval processes and workflows to control information sharing in a collaborative work environment.

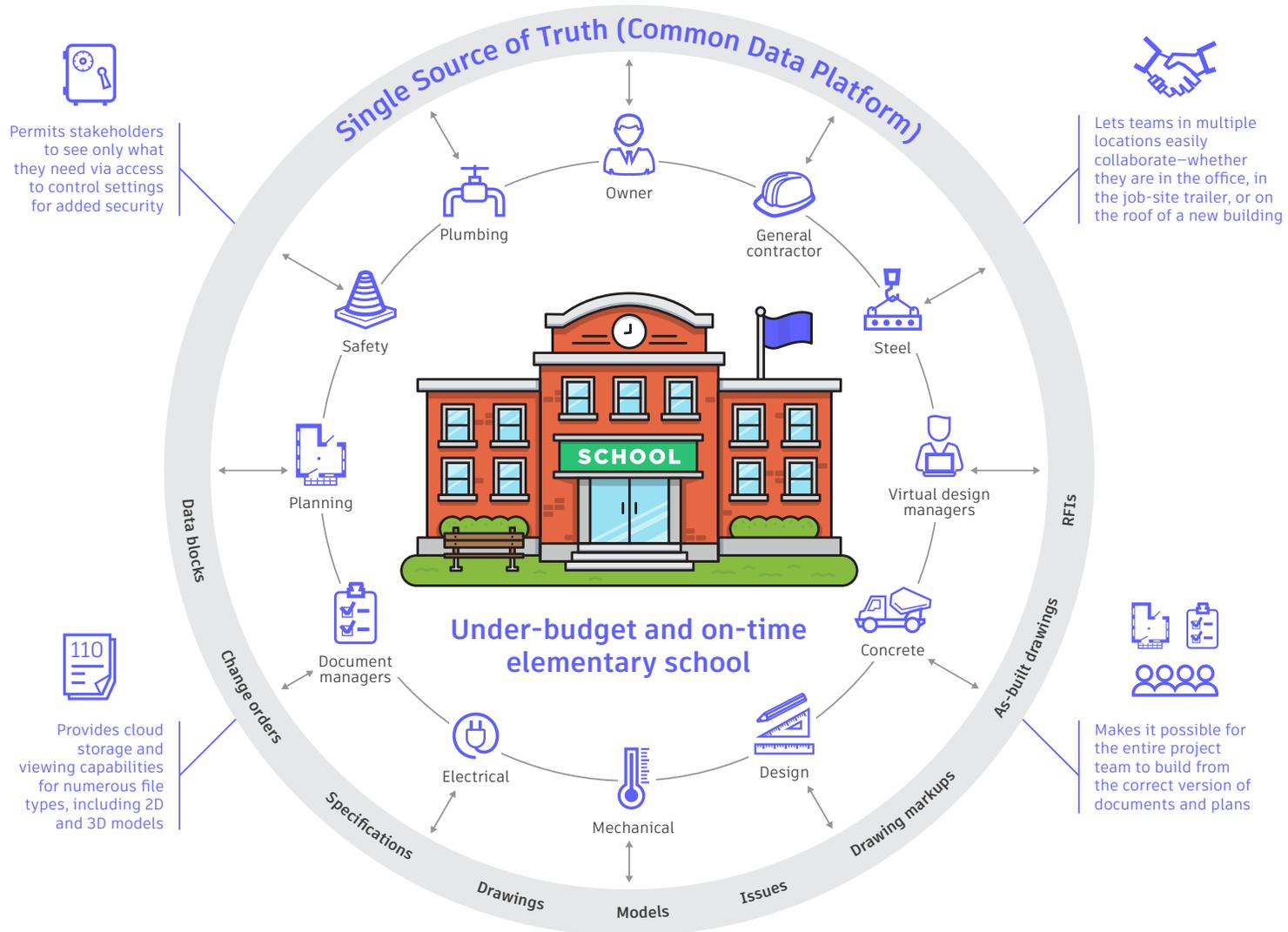
Imagine a single document repository that accommodates project files regardless of their formats or the vendor-specific software that was used to create them. This includes models, drawings and documentation, specifications, contracts, change orders, emails, schedules, videos, and photographs.

Other important functionality to consider are project-based security controls for sharing and publishing information and documentation, including authentication mechanisms for verifying the identities of users, and a permission-based system that can be used to restrict access to sensitive data based on a user's role. This provides teams with a sensible alternative to risky “work-arounds” and shadow IT solutions.

The goal is to empower the various project teams to exchange information in an efficient and collaborative manner using a shared workspace for the entire project, while also limiting access to sensitive data.

## THE CONNECTED CONSTRUCTION SITE.

A common data platform can ensure that all stakeholders are on the same page, and that they always have access to the most up-to-date information.





# Workflows that make work more efficient

When a CDP is designed correctly, it's easy for users to exchange information with other organizations and create an approval process that ensures all teams are working off of documents that have been fully reviewed and approved by the team owner that created them

Built-in workflows that align all project teams and prevent information loss can be invaluable. A good workflow engine can create approval processes for a specific team or owner required to review and sign off on a task, document, or rework before any action is taken in the field.

Tracking all activity across the common data platform—capturing milestones, history, and version information—is also crucial to your project's success. A successfully implemented CDP will help create an audit trail so your teams can see who made changes to a document and when they did it.

Mobile access is another important feature. Whether using iOS or Android on the job site, you'll want team members to be able to access all models and information from a mobile, tablet, or laptop device, ensuring that project teams are no longer chained to the trailer.

# Greater visibility for all stakeholders

With a common data platform, owners will gain visibility into project issues across all parties so they can take data-based corrective actions earlier. In addition, the CDP standardizes on a document structure with rationalized, automated naming conventions, along with user, company, or role-based access control and version control. Stakeholders benefit from anytime/anywhere access to data, via mobile or desktop devices.

## References

- [1] [JBKnowledge Construction Technology Report](#)  
JB Knowledge, 2016



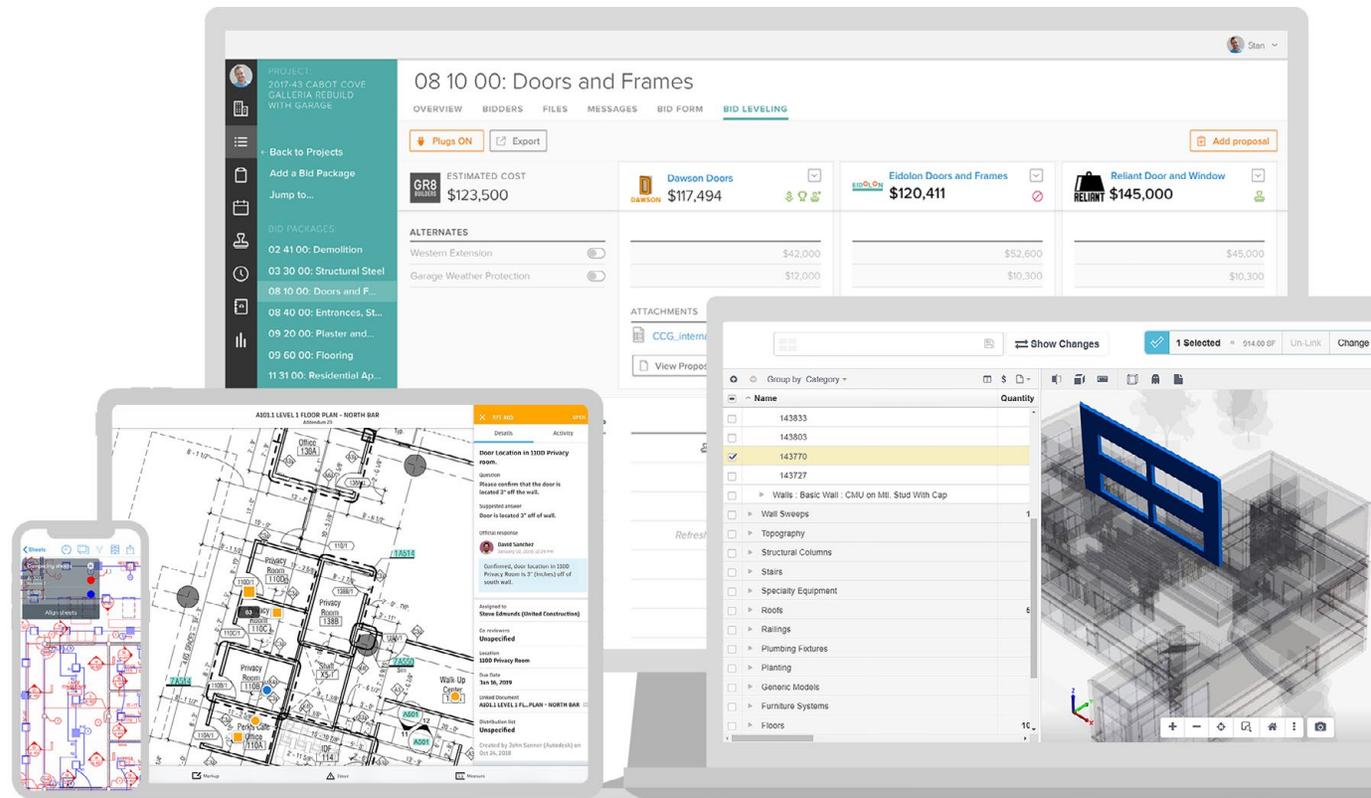
# See the Future of Connected Construction

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Our industry requires solutions that connect their information, teams, and technology –breaking down data silos and disconnected processes that hinder true transformation. As we navigate the ever-present push to do more with less, we need to uncover new ways of working, enhance connected digital workflows, and incorporate advanced analytics. To support us on this journey of transformation, we must lean into tools that connect construction – from design to plan, build, handover, and operations.

Built on a unified platform and common data environment, Autodesk Construction Cloud is a powerful and complete portfolio of construction management products that empowers general contractors, specialty trades, designers and owners to drive better business outcomes. Autodesk Construction Cloud combines advanced technology, a unique builders network and predictive insights to connect teams, workflows and data across the entire building lifecycle.

While the industry experiences unprecedented transformation, our mission remains the same: to help construction teams meet the world's rapidly expanding building and infrastructure needs while making construction more predictable, safe, and sustainable. And we've remained steadfast in our promise to deliver the industry's most compelling solutions, connecting data, teams and workflows from the field. This is our commitment to connected construction.





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