The Benefits of
Cloud-based
Construction
Management Solutions

INTRODUCTION

The construction industry is digitizing at a rapid pace. Today's premier construction management technology can be used on any device with an Internet connection — desktop, tablet, or smartphone — and deployed in a modern cloud. Resources in the office and field can easily work, collaborate, and act whenever and wherever they desire.

Construction professionals see the value and benefits of cloud-based construction management technology, but migrating over from their antiquated processes and disparate systems and workflows is challenging, and many do not have a clear strategy to make the move.

However, without this pivotal move to modern construction management technology, firms may experience significant negative repercussions that can compromise their projects. They also run the risk of being unable to compete with competitors who embrace modern solutions.

The challenges in the construction industry are well documented. Pain points include managing costs and keeping projects on budget, managing the schedule, and coping with project delays. Managing quality, minimizing errors, and determining accountability in the event of change orders and disputes are ongoing challenges. Managing these risks, delivering a successful project outcome, and earning a profit all depend on reliable data. Optimizing that data and crafting a plan to make the switch to systems that deliver it more quickly and effectively necessitates expert advice and training.

The pain points in construction have always existed, but modern construction management software can significantly help minimize the pain points by making processes more efficient, reducing errors, and minimizing risk. One of the goals of BIM (Building Information Modeling) is to have the right information available when needed so informed decisions can be made at the ideal time.

BIM also strives to improve communication between all key project stakeholders, resulting in greater insight, better decision making, and a successful project outcome. A cloud-based, integrated construction management

solution offers the most potential for minimizing risk, reducing errors, and increasing profitability.

A CHANGING ENVIRONMENT

Technology is increasing exponentially in the construction industry. While BIM is being embraced by many firms — and required in many munici-palities — there are architects, engineers, and contractors who have not embraced technological change. For some, faxing plans is still a common occurrence. But a changing of the guard is taking place, and it will expand as Baby Boomers retire.

The culture is adapting — especially the younger generations — and users of all types are more technologically savvy. Now, technology is inescap-able. Almost everything can be shared on a screen. Connectivity in the field is becoming more common. Firms that are not on the cutting edge are not only missing out on opportunities to increase efficiency, they are losing valuable and highly skilled staff members and bids because they lack certain capabilities. In an era marked by a shortage of labor, talent is more likely to go with companies — both large and small— that are more technologically capable.

The huge acceleration of the use of technology in the construction industry is not without its own challenges. There are hundreds of apps on smartphones out in the field that are used in the construction industry. The hurdles include

implementation and training, but perhaps the biggest challenge may be that there are too many apps and software packages causing information silos. The key questions remain: Where is that data, who is in charge of that data, and how is that data being shared?

New technology is, by definition, disruptive. Disruption can mean throwing things into chaos, or it can mean implementing changes that improve inef-ficient methods and solve problems. Management has to walk that fine line and make the right changes for the right reasons. At a company level, and at a project level, the key is to focus on how technology can deliver the project as a whole and, at the same time, help their team members do their jobs.

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When companies look to invest in a software solution, they soon realize that there are very few software products that allow everyone to talk to one another. In some cases, everyone including owners, architects, contractors, subcontractors, and vendors are all inputting the same data into different programs that don't communicate with each other. There are a lot of iPads and smartphones with data out in the field. The real challenge involves coordinating and collaborating all of that data. How do we connect it all?

SINGLE SOURCE OF TRUTH

An automated, cloud-based construction management system such as Autodesk BIM 360 can help with all of these problems.

The solution is a centralized construction management system that connects design and construction teams to the data they need throughout the life-cycle of the project. Risks such as someone having an out-of-date version of the plans are minimized or eliminated because everyone accesses the most up-to-date version of the file from a central location.

The key goal is to have "a single source of truth." Making this goal a reality is what sets BIM 360 apart from traditional construction management solutions, as well as other software solutions.

Historically, different stages of the construction project — design, preconstruction, field execution, handover, and operations — were treated as completely separate events. Information was often lost between the architect and contractors.

The concept of BIM was motivated in part by the desire to capture all the information at each stage of the process and convey it to everyone involved, from the architect to the owner and everyone in between, so that every stakeholder, including the trades, could take full advantage of the hard work that had already been done.

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Even with many modern software programs, there are still problems with silos of information, and errors often result from using outdated information. Incomplete or erroneous data increases risks on all levels, including quality, safety, budget, and schedule, putting reputations in jeopardy.

With a centralized construction management solution such as BIM 360, those gaps can be bridged. In a traditional construction project, a supervisor or foreman on site might make notes and take photos for a resource back at the office to input and communicate action items with others responsible for tasks. With a cloud-based automated construction management solution, the person on site can record an observation, and the person in charge of the corrective action is immediately alerted. It takes away the middle man and minimizes the possibility of human error. It maintains data continuity throughout the life cycle of the project, taking elements that used to be handled discretely and merging them to help ensure that there is no deviation between what is planned and what is delivered.

NUMEROUS BENEFITS

Data continuity has multiple benefits. As noted, an integrated construction management system eliminates the possibility of using outdated information. Files that are emailed to just a couple of people could have their own edits, meaning that multiple versions of a file could be in use. If you have everything saved in one location, you eliminate that risk. Only authorized users can access files, and tools to record and time stamp which users made edits and changes and when. The goal is to ensure everybody is working on and referencing the same information to ensure data integrity.

It also eliminates duplication of data entry. Since all of the modules pull the data from the same place, the data just has to be input once, saving time and minimizing chances for error. Complete, accurate information is available in real time and can be accessed in every module, including the estimating module, contracting module, change order module, and accounting module.

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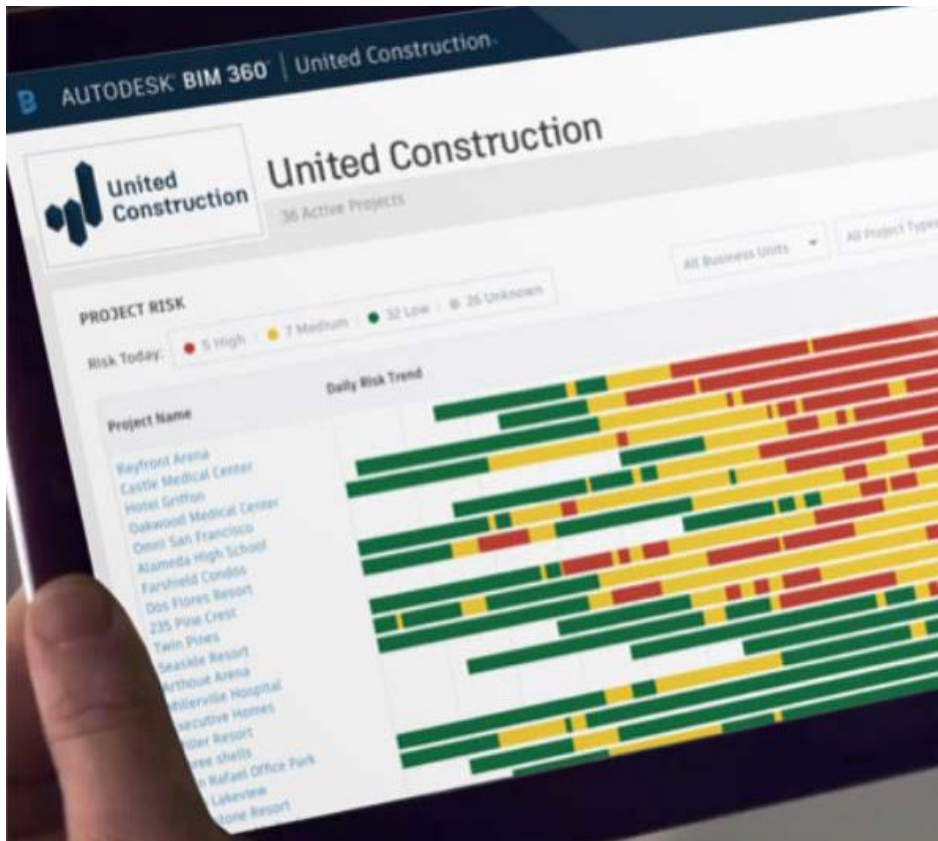
During constructability reviews, models can be more easily compared to identify conflicts, eliminating costly problems and saving time in numerous ways. A cloud-based system allows all parties to do their own constructability reviews before coordination meetings, and meetings themselves can be used to dynamically explore options and find solutions in real time. If there is a conflict between building systems, BIM helps identify the simplest, most cost-effective solution to the problem. It also allows more accurate and reliable prefabrication.

The cloud-based system saves time because team members don't have to hunt for information. They also don't have to waste time uploading and downloading files. Having the information centralized in an area where everyone is working eliminates constant uploading and downloading.
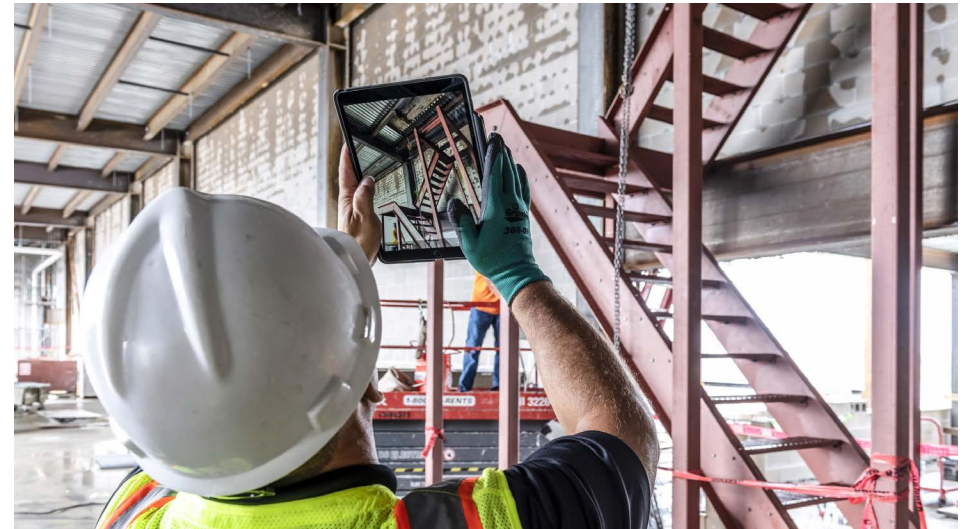
The way systems are integrated also keeps information from slipping through the cracks. If someone notices something during an inspection that needs to be addressed, instead of relying on a manual re-entry of the data and calling the proper person to take action, the system will automatically notify anybody that needs to be aware of the situation. It captures all of the information instantaneously. The inspector just needs to complete their standard procedure for the investigation; they don't have to worry about any follow-up procedures or contacting anyone.

POWERFUL FEATURES, BUILT-IN SAFEGUARDS

BIM 360 connects the design and construction processes and maintains data continuity across the lifecycle of a project. It also offers authorized members of a team the ability to access accurate, up-to-date information anytime, anywhere—from the office or the field—using a desktop, tablet, or smartphone.

Real-time data in the cloud allows direct access to information to all members of the team, along with built-in safeguards to control who has access to it and when. In addition to immediate connectivity and data continuity, optimal cloud-based construction management software should offer the following features:

1. Automatic versioning/version control ensures everyone is working on the most up-to-date files and plans, while, at the same time preserving earlier versions and dialogue about changes for reference. Data structure should include versions, history, and a paper trail for accountability, noting who made changes and when.

2. Augmented reality can take the model to the site before construction to help workers visualize where things will be placed and understand spatially where systems are going to be installed. Walking through the site using augmented reality helps contractors preparing for bids understand the exact scope of the work to be performed. After the project is completed, in a building with critical systems, such as a hospital, an iPad can be pointed at a closed-in ceiling or wall to see where pipes should be located before remedial work is performed.

3. While work is ongoing, metrics can help pinpoint specific issues to be addressed, facilitating problem-solving and diagnosis. With BIM 360, whenever there is a deficiency that is reported (such as inferior quality, a schedule slip, or a safety issue), a root cause must be identified, so trends are easy to pinpoint.

4. Robust reporting functions can make the most of those sophisticated metrics. Reports include tracking how many open issues or overdue action items there are on a project. Reports can be run any time and on a consistent schedule — once a month or once a week, for example — to keep everyone apprised of the status of the project, identify action items, and things that are lagging. Reports are all based on actual activities; the metrics are always there in the background, and the reports let the right people see crucial
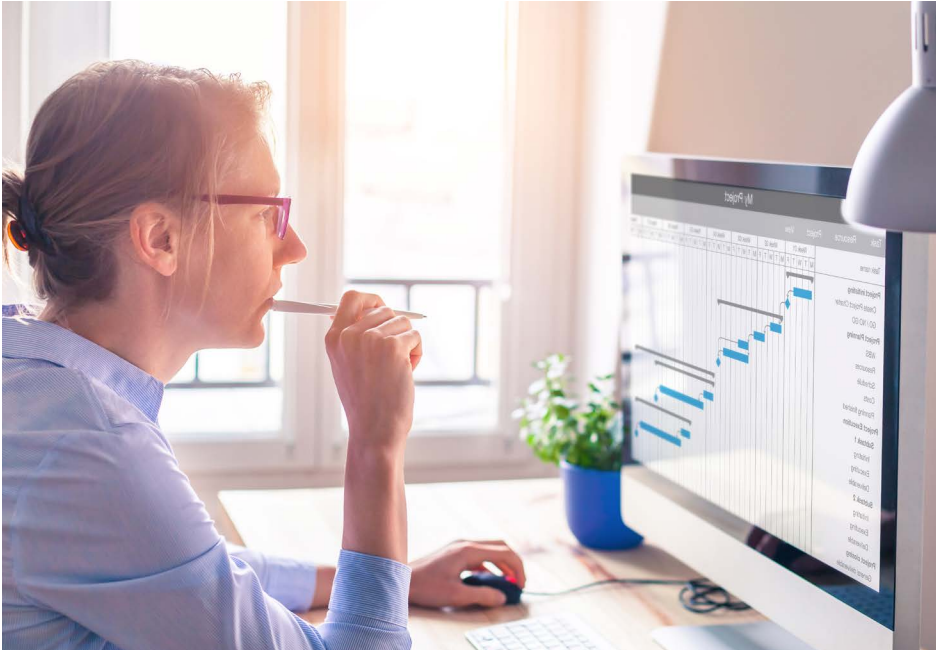
information in a digestible format. If there are problems, a report can help determine the cause and identify trends. Finding out what the drivers are for errors, delays, and roadblocks can provide the information necessary to re-engineer methods or alter plans to better manage and mitigate those issues on a given project and provide future guidance.

5. Gathering information also helps to assess the performance of companies while the job is in progress and after the project

is completed. The system records how long it actually took to complete the project, how many issues were encountered, and how long it took to resolve them. It also documents the performance of the companies involved, giving optimal performers a leg up on the next bid.

6. A more complete data set also minimizes RFIs, which can impact a project's schedule and cost. Change orders are also minimized. The software provides a better picture of what happened and why the change order occurred. Was the change due to a design flaw, an installation error, or did the owners just change their mind? Metrics documenting the reasons for change orders allow users to identify trends and eliminate or reduce change orders in the future.

7. The system can also help limit punch list items and make them easier to complete by sending assignments to the appropriate people. Punch lists generated are complete and more accurate. Assignments can be tracked to exact locations, as well as specific objects and systems. Reporting tools alert companies to open punch list items, ensuring everything is completed and closed out.

Building systems and construction schedules are becoming increasingly complex, and everybody wants things done faster and cheaper. Successful companies have to be able to gauge all facets of a project and, be able

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to zoom in to a minute level of detail as needed. This level of detail is impossible for even for the most experienced construction professional, but an automated, cloud-based construction management system can help companies get the crucial information they need in real time.

EXPERT ASSISTANCE IN MAKING THE MOVE

If the benefits of BIM are so obvious, what is holding companies back from making the move to cloud-based construction management solutions? Cost is a factor, but so is fear of the unknown. As in most big decisions, it's the emotional hurdles that are often the biggest barriers holding people back from embracing BIM.

Typical concerns include a fear that people are going to be replaced by software and that the training will be an overwhelming task added to an already hectic workday. Companies also want to make sure they are going to obtain a return on investment. Tapping into the expertise of a BIM consultant can be the key to getting past these hurdles. The right consultant can reassure employees that software won't replace them, their experience and knowledge can't be replaced, and software and systems can help them do their jobs more quickly and efficiently.

Consultants with experience in architecture, engineering, and construction can also help with implementation and provide individualized training, making transition seamless and provide specific, individualized training that focuses on key areas people in each position need to know. Consultants can also help crunch the numbers and analyze how BIM 360 can increase efficiencies and detail the expected return on investment. They will also explain why investing in a modern construction management solution will become a necessary step for staying in business.

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