

ABC 2022 **TECH** **REPORT**





Matt Abeles, Vice President, Construction Technology and Innovation, Associated Builders and Contractors

ABC continues to invest in helping our members find and select high-quality construction technology available to them through our Tech Alliance, Tech Marketplace and Tech Report. In the 2022 Tech Report, we show the construction industry how our members' commitment to technology and innovation has led to more profits, safer jobsites and more work. The case studies in this report highlight how our members produce the most robust value proposition to their clients by highlighting the successes of a select few of our members and their commitment to innovation and technology. ABC creates the conditions for construction companies to innovate, differentiate, attract and educate their top talent, ultimately to win and deliver their work safely, ethically and profitably for the betterment of the communities in which they work.



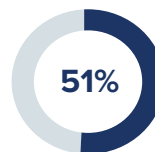
Jack Hineman, Vice President of Business Intelligence, Gaylor Electric, and Chair of ABC Construction Technology and Innovation Committee

Over the past few years, I have presented on my role and findings as vice president of business intelligence at Gaylor Electric. Based on my experience during those presentations, I would guess that half of those reading this think I made that title up. However, that is my actual title! So, what does that mean? It means that I study our data and visualize it for our teams (I make graphs), and my mission is to uncover and communicate the stories in our data to eliminate emotion and propel data-driven decision-making.

Throughout the 2022 issue of the Tech Report, you will read case studies about various innovations within our industry and how our members are evolving. There is no arguing that the construction industry is advancing. We have made obvious leaps in regard to safety, drone scanning, GPS layout, modeling and more.

But my area of expertise is data. And in terms of data, I would say that the construction industry has yet to evolve. I recently applied to speak at Tableau Conference (Tableau is a visual analytics platform now owned by Salesforce). As I was completing the application, I reached a dropdown box for "industry." Despite construction being the second-largest industry in the world, I still had to choose "other" from the list of over 20 industries. How is it that construction is not on their list of industries?

Well, the results from last year's Tech Report provide some insight. In the survey we conducted, we asked, "What office project management software is your business using?"



51% of members are using Microsoft Excel for office project management.

Source: ABC 2021 Tech Report

Microsoft Excel was a common answer on many of the questions. Don't get me wrong, Microsoft Excel is a great product, but it is not an appropriate location for your project management data. For maximum impact, we need to be using purpose-built software that we can then leverage to aggregate our data, which we can then use to make data-driven decisions.

Another item of note from last year's Tech Report was that our members wanted case studies more than any other resource when it came to technology and innovation. As a result, the Construction Technology and Innovation Committee has decided to change direction with the 2022 Tech Report. Rather than conducting another survey and showing what would likely be similar results, we have gathered case studies of member companies that have innovated in various ways. We hope these will provide inspiration for your next innovation.

HITT

Robotics Is Changing Construction

By Karl Sorensen, Director of Project Solutions, HITT Contracting

The recent emergence of robotics within the construction industry is an exciting proposition that HITT Contracting has long awaited to explore. Among the countless reasons robotics is particularly interesting to our organization, none have been as important as site workforce safety and empowerment.

For those of us within the industry, we certainly understand the risks associated with construction work. Therefore, whenever there's an opportunity to lower that risk through innovation, especially for our most compromising job functions, we relish every occasion.

In the past year, we've implemented a suite of robotic solutions in our work at HITT. On-site at WMATA HQ in Washington, D.C., our teams partnered with HILTI utilizing their semi-autonomous Jaibot to drill ceiling anchors, saving team members from difficult overhead work. Our team and subcontractors drilled 262 new anchors in four hours, ultimately resulting in a pace that allowed a 10-day task to be completed in just four with no safety incidents. In 2021, our R&D team also spec-designed a robot that improves the worker experience and overall communications on large horizontal jobsites like industrial and data center projects. The robot can capture images and relay them from miles away to our team on the same jobsite with excellent efficiency.



Figure 1. Contractor controlling HILTI Jaibot

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Figure 2. HITT's custom rover-style robot used for image capture, two-way communication

To this end, robotics provide a fresh perspective on a familiar landscape. Whether leveraging robotics to manage repetitive or harmful tasks (such as core drilling or lead abatement), to measure progress and quality (providing real-time data exchange for tightly sequenced work) or to continuously capture and share visual data to improve communication and alleviate on-site labor congestion, construction robotics provide a path forward to a safer, more sustainable project delivery experience for our field operations.

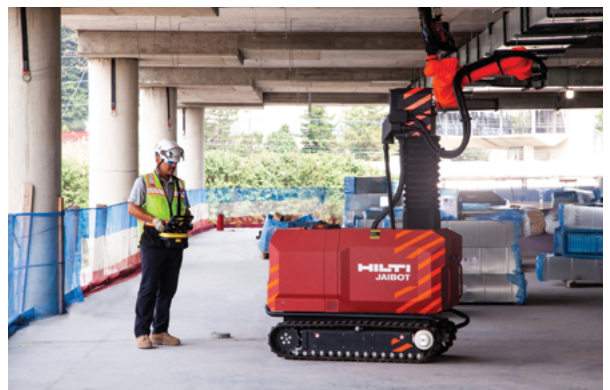


Figure 3. HILTI Jaibot drilling ceiling anchors

Soaring to New Heights With Drones

By Patrick Scarpati, Virtual Design and Construction Manager, and Carlos Zuluaga, Project Engineer II, Harkins

Unmanned aerial vehicles, more commonly known as drones, are a growing technology in the construction industry. Once implemented, this technology quickly demonstrates a high return on investment for project documentation, quality control, safety management and stakeholder engagement. Therefore, it is not surprising that Harkins has decided to enhance our drone program to be an all-encompassing application of hardware, software and processes to help our project teams in their day-to-day operations.

On one specific job, Brightview Columbia, the team fully embraced this technology by purchasing a job-dedicated drone and continually testing approaches that would benefit all project stakeholders.

The Project

Centrally located in Columbia, Maryland, Brightview Columbia included the new construction of a 198,459-square-foot luxury senior living community. This four-story structure is a mix of Hambro and wood frame. Harkins' scope of work also included the historic renovation of the adjacent Athol Manor, a 280-year-old historic landmark that now serves as the headquarters of the Community Foundation of Howard County.

The Equipment

In terms of equipment, Harkins used a DJI Mavic 2 Pro drone. This quadcopter has a 20-megapixel camera mounted to a three-axis gimbal and provides a flight time of up to 31 minutes with a single battery. The real power of the drone is realized when used with software such as Pix4D and DroneDeploy, which captures data using pre-planned missions in which the drone flies autonomously. In addition to pictures and videos, the drone has software photogrammetry capabilities, resulting in aerial images, orthophotos and 3D models.

Photos and Videos

Drones can easily, rapidly and cost-effectively capture aerial imagery. Previously, Harkins used to take progress pictures several times a week. Now, using DroneDeploy, the team created an automatic flight plan that allows them to take pictures at the same location and elevation on the perimeter of the jobsite, as shown in Figure 1. A similar process was completed to create monthly videos of the project, in which the drone flew automatically on the perimeter of the entire site.

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Figure 1. Drone photos

Orthophotos and Drawing Overlays

Using photogrammetry techniques, hundreds of pictures taken with the drone can be combined into an orthophoto, which is a high-quality aerial picture that has been corrected to have a uniform scale. As a result, drawings can be overlaid on the orthophotos with great accuracy, as shown in Figure 2.



Figure 2. Flight planning, orthophoto and drawing overlay

At Brightview Columbia, overlays proved to be an excellent tool for site coordination with the many trade partners, evaluation of site activities for progress payments and efficient safety and quality controls. For example, during the foundations stage of the project, the team flew the drone and created a drawing overlay of the structural drawings prior to a concrete pour. Upon closer inspection, the team noticed that a column did not align with the drawings, and we immediately alerted our concrete trade partner, who validated our observation on the ground. The problem column was corrected before it was poured, saving thousands of dollars in demolition and replacement costs, while also avoiding schedule disruptions, as shown in Figure 3.

Measurement Capabilities and 3D Models

The photogrammetry process also results in realistic and easily shareable 3D models. This “digital twin” provides means for measuring lengths, areas and volumes of the site conditions, as depicted in Figure 4. When properly calibrated, these measurements are very accurate. In a recent project, our sitework trade partner had a third party quantify the volume per soil stockpile. When our trade partner shared the data with us, our measurements were within two cubic yards on a 1,600-cubic-yard stockpile. This is a clear example of objective data helping to make informed decisions in a collaborative environment.



Figure 3. Quality control with drone imagery

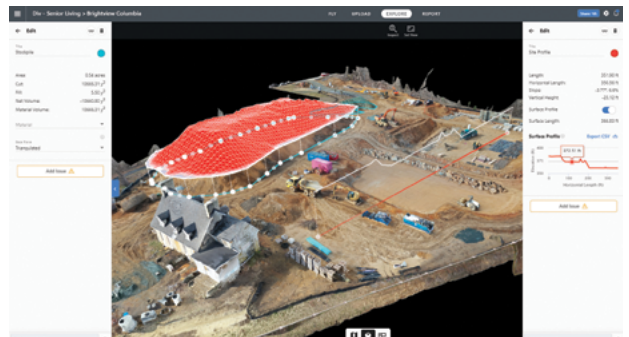


Figure 4. Measurable site data at your fingertips



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SAFETY
a part of your
company's
DNA

Start your safety journey
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Gaylor Electric's Analytics Evolution

By Jack Hineman, Vice President of Business Intelligence, Gaylor Electric

My mission as the vice president of business intelligence is to uncover and communicate the stories in our data to eliminate emotion and propel data-driven decision-making. Emotion is difficult to eliminate. We are all susceptible to emotions influencing our decisions. And without data, decisions in our industry are largely based on anecdotal evidence.

Hindsight

One of the main purposes of my studies is to find the recipe for a successful project. I have gathered some of those ingredients in what I have call the "hindsight" report. Here is the approach I take:

1. Sample our completed projects going as far back as the data allows.
2. Rank/sort those projects based on a given metric.
3. Group the projects into decile (10%) tiers.
4. Aggregate the financial performance (profitability) of those tiers to see if a story develops.

Metric: Purchasing

What do our team's purchasing habits tell us about project performance? For this metric, I took the total job cost/average purchase order amount to determine if teams were making several small purchases or if they were making fewer large bulk buyouts.

As you can see, the projects that have the highest average purchase order make 26% in profits, while the projects that have the lowest average purchase orders only make 8%, with a clear trend line between the tiers. The data revealed the story of the strength of the team's plan. Profitability increases as the size of purchases increases, and it takes a strong plan to be able to make those large purchases.

Metric: Work Breakdown Structure

One year, at our annual summit, I attended a session on creating a work breakdown structure. The presenter mentioned that we want to build a work breakdown structure that has phases no larger than 300 hours.

Once again, the data reinforces the importance of planning. Projects with a well-defined work breakdown structure are more successful than projects where the work is not broken down.

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- ▶ 2020 National Excellence in Construction[®] Award
- ▶ 2021 National Safety Excellence Award
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Dashboard

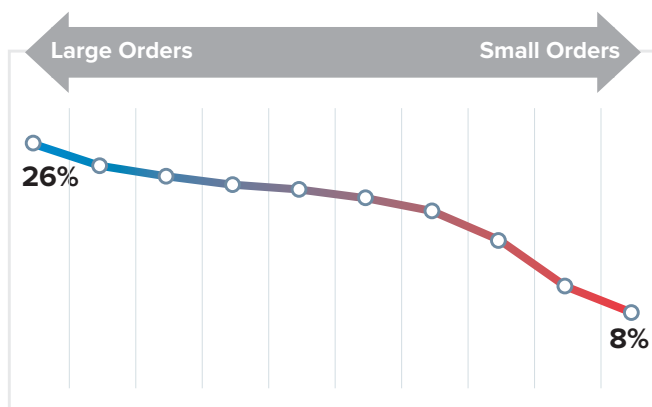


Figure 1. Profitability decreases as the relative number of purchase orders increases

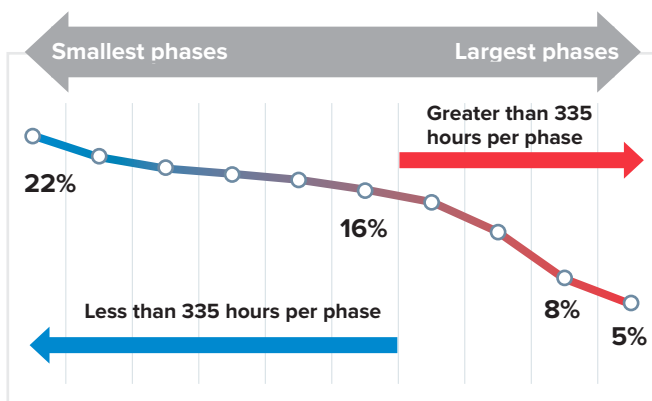


Figure 2. Profitability decreases as the size of phases increases

Metric: Travel

How much does travel affect the outcome of a project? For this metric, I calculated the distance from our office to the jobsite. My expectation would be that we would see a smooth line like previous projects where profit drops the further that we get from the office.

My instincts were wrong. I did expect to see profit drop on our long-distance projects (9%). However, I wasn't expecting to see that the worst place for us to work is within five miles of our office (8.5%). It makes sense once I thought about it. Who wants to drive by a competitor's jobsite trailer on their way to the office every morning, and who wants to sit in a jobsite trailer when their office is only three minutes away? This is probably the most important part of an analytics department. Confirming existing theories helps sway some skeptics in the organization. However, the real change comes when the data breaks those existing theories. It gives you the keys to pivot and make better decisions moving forward.

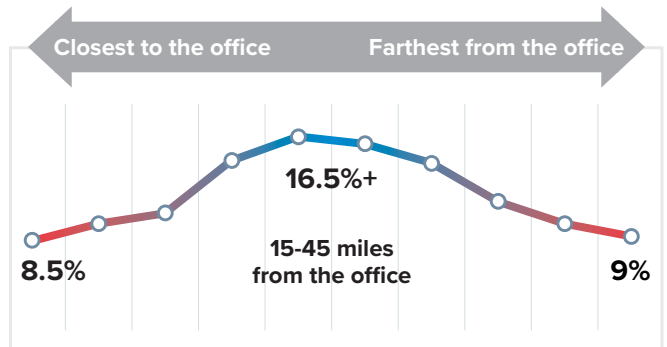


Figure 3. Project profitability based on travel

Takeaways

This is just a glimpse at how data can help empower your business to make better decisions. There are powerful stories waiting to be told in the data you already have. Depending on the size of your company, there are many ways to get started ranging from bringing in a summer intern to building a business intelligence department. Also, if you aren't already, please participate in ABC's STEP Safety Management System. Imagine the stories we could find if we could aggregate these numbers for all ABC members.



Using Estimating Technology to Increase Bid Volume

By Darya Aseyev, President, Nexen Construction

Nexen Construction is an exterior cladding system installer. We have seen how implementing the right technology can streamline estimating processes and therefore increase bid output. In the past, Nexen used a combination of methods to estimate their jobs and send proposals. Our process included: receiving an email, uploading the blueprints into a takeoff platform, doing the takeoff, estimating in Excel and finally creating a proposal in Quickbooks Online. The estimating process was burdensome and slowed down the amount of takeoffs produced, proposals that could be sent, and in turn, jobs that could be awarded to us.

It was midway through 2020 that we began trying out STACK estimating technology. Slowly learning the software and creating new processes for using the software, we saw an increase in bid volume. Since fully implementing the new estimating process through STACK, and adding a person solely for takeoffs, bid volume shot up 41%.

Nexen went from 378 bids in 2020 to 921 bids in 2021 when STACK was fully implemented.

At Nexen, we attribute the increased bid volume to several aspects of STACK's software. The calendar function in STACK organizes the requests for proposals in a job folder according to due dates. This function organized the estimators schedule, while the actual job folder housed blueprints and specifications so that everything needed is in one place. Those tools increased the efficiency of the estimators.

STACK is also cloud-based and could be accessed on different computers and in different locations, which did not limit where estimators could do takeoffs. This ease of accessibility increased productivity. The user-friendly takeoff system also sped up the takeoffs output. Overall, organizing the bids on the calendar, ease of accessibility and streamlining our takeoffs increased Nexen's bid volume.

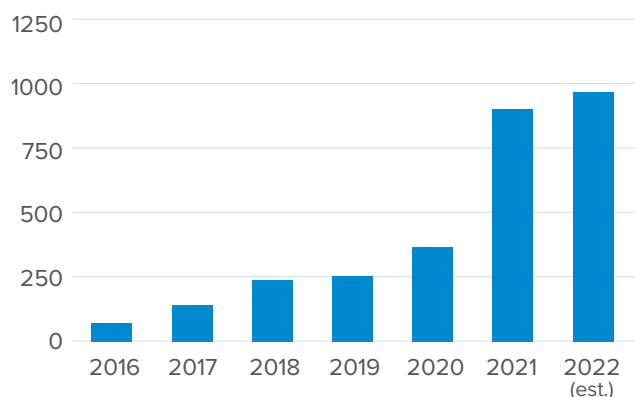


Figure 1. Bid volume since 2016



HENSEL PHELPS

Plan. Build. Manage.

Reality Capture

*By Jim Park, VDC Manager,
Hensel Phelps Construction Co.*

As new technologies have emerged in the construction industry, I have witnessed first-hand the major improvements made, both to quality and efficiency on the jobsite. One advancement in particular, reality capture, has introduced new ways for our industry to collect data for as-built documentation and quality assurance processes. By utilizing new tools and innovations like reality capture, the way we collect, view and maintain data has been transformed, helping to eliminate common industrywide challenges.

In my experience, for any project on which you are trying to utilize and maximize reality capture technologies, the initial capturing process is critical. Having accurate and complete data is necessary to have a successful implementation for preconstruction, construction and building management and maintenance needs. Terrestrial laser scanners have been pushing the limits of what is possible. There have been great leaps in increasing capture rates, improving color images and making the registration process more accurate and efficient.

Closing the gap between the field and office activities has been yet another challenge for the construction industry. Field applications on mobile devices now allow for content to be registered and consumed in the field—with workflows for floor flatness reports or colorized quality reports for comparing sleeve locations and other content to the design model. This technology allows our teams to identify and address issues in the field quickly and effectively.

Capture rates have greatly improved with mobile mapping systems for terrestrial scanners. Lidar technology has found its way onto many platforms, from drones capturing site topography, to car-mounted units capturing roadways, to handheld devices for getting into tighter spaces. Automated capture is now possible with new platforms such as robotics like Spot from Boston Dynamics. This technology allows for a completely automated capture process, using planned missions to capture, process and distribute information, all while connected to charging docks strategically placed on site. This innovation is a game changer, allowing scanning to be performed more frequently with fewer personnel.

Another major shift I see is how data is utilized. Point cloud data can be used for determining existing conditions, quality checks and more. With improvements

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- ▶ 2019 National Safety Excellence Award
- ▶ 2021 National Inclusion, Diversity and Equity Excellence Award
- ▶ 2021 National Excellence in Construction® Award
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Figure 1. Small unmanned aerial vehicles, or drones, are now common on construction sites for building inspections or volumetric measurements



Figure 2. Robotics can help automate common tasks such as laser scanning or 3D photo documentation, increasing project staff efficiency

in technologies such as AR, VR and 3D printing, there is a growing number of downstream use cases for this data.

Virtual reality allows for virtual site visits—we have had great success allowing end-users to participate in the design process by virtually interacting with models. Point clouds can also be viewed in VR, which provides an immersive experience.

Augmented reality has brought BIM coordination into the field, allowing field staff to visually see the model in its real-world location. Having access to AR technology allows our teams to easily identify potential clashes or other issues. This can be viewed on headsets like the HoloLens or even on tablets.



Figure 3. Augmented reality and mixed reality wearable devices allow field staff to experience the design model like never before

With improvements within the 3D printing space, it has become more common to see 3D prints utilized throughout the project lifecycle. Printing models to convey designs is nothing new, but models are now being used increasingly more by project teams for training, logistics and site

utilization. Models can be assembled and disassembled to show phasing and communicate the construction schedule to the project team in a very intuitive way. As this technology continues to improve, much of the actual construction may shift to large 3D printers installed on site or in prefabrication shops.

As our industry continues to experience a worker shortage, we need to continue adopting new technologies and innovations, becoming more efficient to do more with less. As hardware, software and workflows continue to improve, growth in areas such as reality capture will be the catalysts that push the construction industry forward. It is innovations like these that enable our teams to tackle complex problems with unique solutions.



Safety Data Sheets: A Right to Know

By Jamie Holmes, Marketing and Communication Manager, T.W. Frierson

T.W. Frierson embraces safety and health as a core value and is committed to the elimination of personal injuries, occupational illnesses and damage to equipment and property in all our operations. Through the guidance and expertise of our EHS professionals, unsafe work conditions are eliminated.



Figure 1. TWF QR code hard-hat stickers

As part of a recent safety initiative, we rolled out QR code hard-hat stickers that have been distributed to every T.W. Frierson employee-owner. We believe that all employees on our jobsites have the right

to know what chemical products they are working with and should have access to our safety data sheets. With the rollout of the new TWF QR code hard-hat stickers, it is simple and convenient for all employees to access our SDS with their smart devices.

The QR code links directly to our personalized Sphera account. Sphera is the leading provider of environmental, social and governance performance and risk management software, data and consulting services with a focus on environment, health, safety and sustainability, operational risk management and product stewardship.

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- ▶ 2021 National Excellence in Construction® Award
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Many companies struggle to connect data throughout their organizations and to communicate risk efficiently and effectively. We've also found that it's hard to complete such an enormous task, which is why we opted to utilize SpheraCloud.

Our corporate EHS manager, Nathan Heppler, led the charge to push for this cloud-based software as an alternative to the many hard copies of SDS that were stored in binders in our jobsite trailers. He spent months meticulously reviewing and adding all SDS to our SpheraCloud account.

“By using a cloud-based software for SDS Management and employee accessibility via QR code sticker we are giving our workforce their ‘right to know’ through innovation.”

– Nathan Heppler, Corporate EHS Manager

The platform has empowered our company to gain a comprehensive view of performance and risk in real time, breaking down information silos so everyone can have the same holistic view. We can access our SDS from anywhere on site and no longer have to spend time searching through binders in the jobsite trailer to find what we need.

CIANBRO

It's All About People: Leveraging Technology to Enhance Our Mental Well-Being

By Michael Bennett, Vice President,
The Cianbro Cos.

For many years we have focused our attention on the behavioral health side of safety. We realized that it was not faulty tools or equipment that were hurting us but our behaviors. But why?

As we explored this more, we identified the analogy of a backpack. Every day, we all wake up and put on a backpack. When we get to work, we place items in our backpack and that is called work. However, before we even get to work, we have weight in our backpack and that is called life. The weight varies from day to day. We do our best to manage this weight, which is comprised of many things: our health, family, faith, community, etc. This weight impacts our ability to focus, our emotions and our response to various situations, just to name a few.

We began educating our team members and their loved ones on mental well-being. We took a pledge to put an end to suicide in the industry.

When we are able to focus, we perform at our best. We think more clearly, we tend to be happier and we tend to be more productive. However, many of us have so much weight in our backpacks, it is a chore to just make it through the day. Once again, this is not good enough. How do we enhance our ability to manage what is in our backpacks? Like health and safety, we need to be proactive versus reactive.

To do this, we partnered with Dr. Krishna Bhatta. Dr. Bhatta and his team of professionals from around the world and began building a set of virtual tools to help others enhance their mindfulness. This tool is called Relaxx.

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- ▶ 2021 National Safety Excellence Award
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Relaxx keeps the concepts quite simple:

“Mindfulness meditation and the practice of silence is essential to resting the brain and is also an opportunity to spend time with ourselves, to get to know what is going on across our interior mental landscape.”

Everyone has a journey in life and there are times when that journey can leave us lost and confused, especially in our professional endeavors. Relaxx is designed to help both aspiring and highly successful people become mindful of their career journey and find increased success as a result. Relaxx workplace wellness options include pain management, mental health and using time wisely.

Working collaboratively with Dr. Bhatta and his team, Cianbro has customized the Relaxx app to fit the construction industry. In addition to the mental well-being tools, the app also includes leadership lessons from the likes of Dr. George Manning (“The Art of Leadership”). These tips and tricks to managing anxiety and stress and creating positive energy are also available within this virtual tool.

We believe if we can become better at managing what is in our backpacks, we will see increased performance in our workplace safety, production, quality and, most importantly, our quality of life.

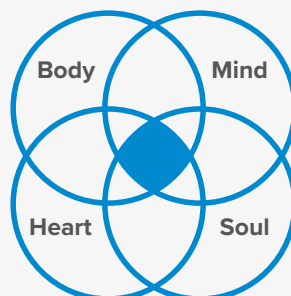
The Total Human Health Program

Physical wellness promotes proper care of our bodies for optimal health and functioning

Emotional wellness is an ability to cope effectively with life and build satisfying relationships with others

Social wellness is a sense of connectedness and belonging

Source: *The 7 Habits of Highly Effective People* by Stephen R. Covey



Mental health refers to the cognitive aspect of health

Intellectual wellness is when you recognize your unique talents

Financial wellness is a feeling of satisfaction about your financial situation

Occupational wellness is a sense of satisfaction with your choice of work

Spiritual wellness is related to your values and beliefs that help you find meaning and purpose

Cincinnati-Based Business Utilizes Innovation in Glass

By Brendan McAndrews, COO, McAndrews Glass

Perhaps it is the new, emerging window systems and glass types that are changing the way energy efficiency and windows are viewed. Maybe it is the photovoltaic glass—the process of harvesting energy from the sun from within glass units—that will help provide new energy solutions. Or maybe it is the way we operate to be more effective to provide a high-quality product.

McAndrews Glass uses technology to innovate—whether it is vehicle-tracking software, geofences on jobsites, air tags to track equipment or a machine to fabricate for us. Among these, I believe the technology that has helped us advance and grow the most also happens to physically be the largest item in our shop: our fabrication system.



Figure 1. Auto infeed with auto push arm

The fabrication system allows one employee to do the work of five. This comes in particularly handy right now as the trades face a major skilled worker shortage.

The machine we own takes storefront and curtain wall material and pushes it through a fabrication center where it can drill from the top, bottom and front to create fabrication holes. Then a 90-degree up-cut saw trims to cut the product to the required size. All of this is done with an auto infeed that allows an employee to work up to 10 stock lengths of material at a time instead of one with manual fabrication.

Once a piece of material is run through the machine, the pusher arm comes back out and allows the other



Figure 2. Fabrication center with 22-inch up-cut saw and three-axis drills for fabricating holes

material to advance and restart the measuring and drilling process. The machine measures to 1/100 of an inch for fabrication accuracy. Two laser eyes, one at the infeed and one at the outfeed, do this. This results in a product that we can then hand off to our assembly team.

The efficiency of the machine, in conjunction with other programs, allows us to label material with laser-printed tags as it comes out of the machine. These labels have the job name and specific location the frame is for in the building, saving the installers time. It also breaks down the information for the assemblers to follow, as it labels pieces and directs “part one goes with part two” and so on.

This level of communication reduces the required time to educate someone new to our industry and maximize productivity. While this is the basic process, what is incredible about this technology is that it remembers every extra part over a certain size left from prior jobs and labels it as a part that goes into a bin. Then when we run a future product with the same material type, the machine tells us to use the leftover pieces and start from there. This reduces waste and maximizes profits, positively affecting the bottom line.

This is just one machine that we use in the glass and glazing industry to help move prefabrication to the field. This saves time and money, increases quality and, most importantly, helps us work safer with less direct interaction with drill bits, sharp edges and saw blades.



Skiles Group Leverages Technology to Evolve Site Safety

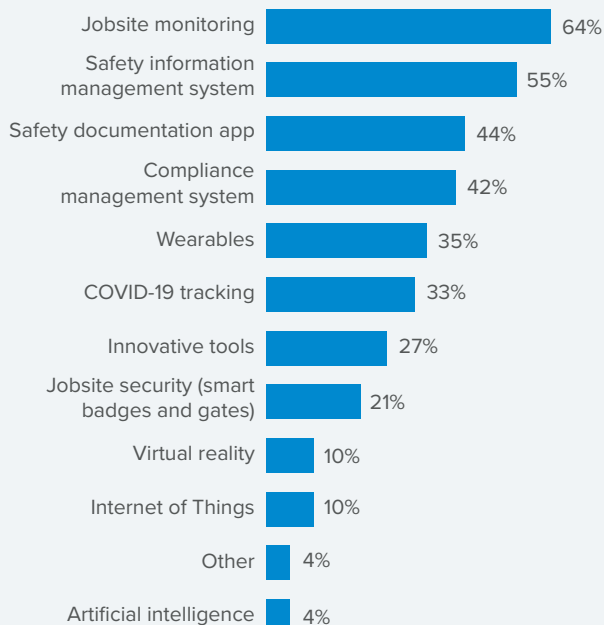
By Keyan Zandy, Chief Executive Officer, Skiles Group

The industry standard for issuing an emergency alert across construction sites has long been an air horn. For example, three long blasts to evacuate the area to the assembly point, or three short blasts to shelter in place. However, this is not useful when our project is in an operational facility, or when those sounds are compromised by the inherent noise level of equipment. It's also not effective on dynamic project locations where workers are spread across a large campus and, in certain types of emergencies, such as an active shooter situation, sounding this type of alarm could draw unwanted attention and prove to be more harmful than beneficial.

We believe that providing every team member on a jobsite with quick access to accurate information has the potential to save time and lives, and we agree that the currently accepted tools (horns, flags, laminated posters placed around the project sites and so on) are unsatisfactory toward achieving that goal—especially

What safety technology are you using today or planning to use in the future? Check all that apply.

All respondents, percent of total



Data collected by ABC National from the 2022 Workforce Development Survey

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- ▶ 2021 National Excellence in Construction® Award
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when viewed through the lens of OSHA's regulations 1910.38 and 1910.165, which explicitly state that construction sites are required to have and maintain an employee alarm system that uses a "distinctive signal" for each purpose.

Solving the problem of spreading information far and wide has caused our team to think smaller instead of broader—specifically, we focused on developing an individually accessed solution for the purpose of either efficiently notifying others of a specific emergency situation or receiving a notification and immediately understanding what to do next based on that distinctive signal.

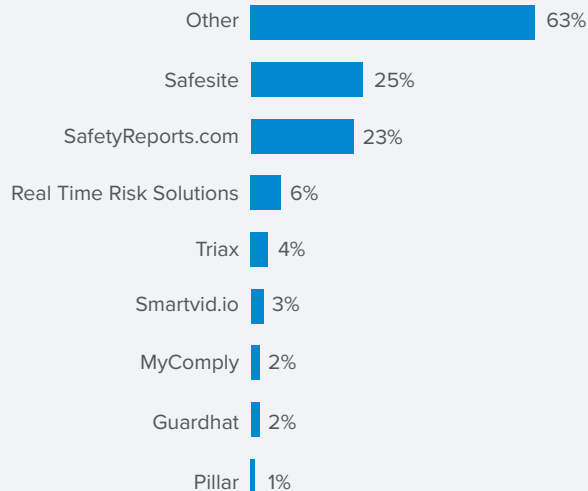
Because the solution seemed so obvious, it came as a surprise that it didn't already exist: a smartphone app. While there were a few applications that did some of what we wanted, none existed that did everything we needed. Ultimately, we took the leap into entirely new territory for a construction firm, and in 2018 we embarked on the development of our own app, subsequently named Smart Safety, which provides field staff and project administrators with one-click access to site-specific emergency protocols and resources on all of our active jobsites.

On the back end, the administrator enters the project site's geolocation and geofencing data and uploads project-specific emergency action information like evacuation plans, rally points, fire extinguisher locations, nearest hospitals and clinics and closest first responders. The app is easy to set up for each project and only takes about 15 minutes to create on the smartsafetyalert.com website.

Each on-site team member downloads the app on their smartphone, and then "checks in" to the project by scanning a QR code or using a PIN at the entrance fences or gates. If the team member sees an emergency, with one-click access they can alert the supervisor to the specific issue (such as medical, fire, gas leak, etc.) and with an automatic tag to the exact location of the situation with geocoordinates. The supervisor verifies the emergency and issues the full alert to all other users on site. All team members then receive an immediate distinctive signal notification for

Which technology companies do you use, or have you used to research, purchase or deploy safety technology?

All respondents, percent of total



Data collected by ABC National from the 2022 Workforce Development Survey

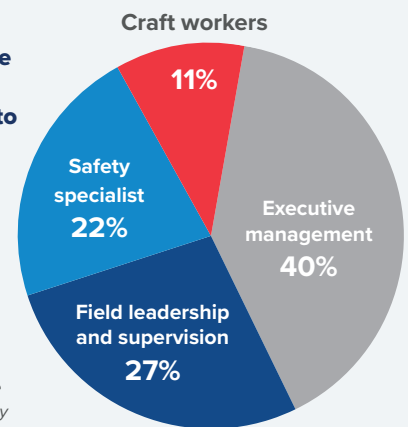
the type of emergency and information to guide them toward their next steps. Once the situation is resolved, the team members receive an update for all-clear to resume work.

While a 911 call is always the first step, the push notifications provide better information faster; reduce confusion and chaos; and ultimately enable team members to either quickly evacuate a compromised location, suspend work or stay clear of an emergency scene that's occurring in another part of the jobsite.

We designed Smart Safety to be bilingual to meet the needs of both English- and Spanish-speaking workers, and we made it run as cellular-enabled versus Wi-Fi-dependent, to ensure a more reliable connection.

Our employee-driven culture of curiosity and continuous improvement fueled the creation of the Smart Safety app, and the result has the potential to create a better working environment for our employees, trade partner teams and even our clients and public at large. Beyond our project sites, we've just introduced the app to other construction firms to help improve their crisis management processes and provide additional communication and clarity for any emergency situation that may occur. After all, when it comes to safety, we are all in this together.

Who is involved in the identification and decision to purchase and deploy safety technology?



Data collected by ABC National from the 2022 Workforce Development Survey

ABC Safety Technology Resource Guide

Have your fingers on the pulse of safety technology by visiting ABC's Safety Technology Resource Guide. There you can view tips and tricks for behavior-based safety programs, good catch/hazard reporting programs, safety performance dashboards and many others!

Visit us online to view the guide:

abc.org/safetytechguide

Site Contractor Creates New Technology to Dig More and Write Less

By Brent Kreider, President, B.R. Kreider & Son Inc.

B.R. Kreider & Son Inc. is a fourth-generation site contractor doing business for 86 years in south central Pennsylvania and northern Maryland and an ABC member since 1981. We have seen significant growth over that time but had always relied on our proven processes and procedures, which involved the use of manual paper timesheets, vacation requests, job instructions, jobsite directions, etc. We could no longer efficiently scale with these methods, and it was costing us significantly in fuel, data entry time, human error and inefficient communication or information sharing.

Our team members used to fill out a paper timesheet each day, hand it to a supervisor who needed to attach phase codes to the work performed, then hand it to accounting to manually input the information into our ERP system to process job costs and payroll. This meant everyone had to stop by the shop, creating considerable inefficiencies in travel, fuel and time. It also caused many delays in getting information back to management to make decisions on our jobs.



Figure 1. Jobsite app

We decided there had to be a better solution and began the process of searching for a way to automate our processes to create better communication, save time and reduce our costs. We did an extensive due diligence search of off-the-shelf software

solutions, as they tend to be more cost effective. What we found was that they could not handle accounting of our equipment, were not simple for our team to use, had us paying for options we could not use and did not address the many other items we wished to tie into this project to avoid changing what has worked for 86 years. We determined that the best solution was to contract with Industrial Resolution for a custom software solution.

Industrial Resolution listened to our needs extremely well and helped us develop a solution that is simple, built trust with our team, improved our communication and reduced

our costs and time. We developed a very simple jobsite app that team members can bring up on their phones to clock in and out, pull up jobs, click on directions to the job, find the task description for that job and submit their time. They can now simply go straight home and submit their time, saving them from spending more time at work to stop by the office and fill out a paper timesheet. Supervisors could then approve or edit that timecard as needed from wherever they were. Task descriptions are already filled in, and clock-in times show where the team member was verifying their time. This has saved our accounting department from manual entry tasks, saving approximately six hours per day.

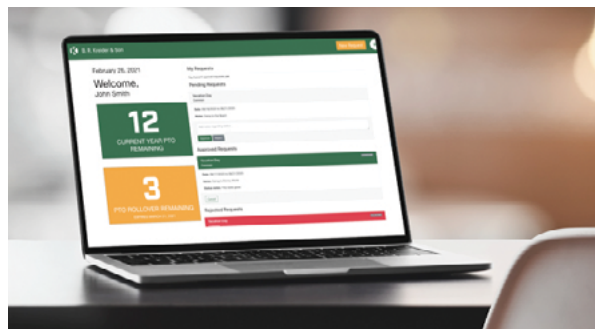


Figure 2. B.R. Kreider & Son Inc. web portal

In addition, Industrial Resolution developed a B.R. Kreider & Son Inc. web portal that allowed our team members to see how many PTO days they had, request days off and get approvals from management easily and quickly without waiting on the typical paper trail. This saved additional time as team members no longer had to check with HR on how many PTO days they had left, etc.

We also utilized the same platform to create a digital weekly safety toolbox check-in available online for them to learn and review when needed. A tool for operations was added that allows dispatch to post job assignments the night before, so each team member knows where they are going the next morning to further streamline our job dispatch process. We did not stop there. We added our team member policy manual, safety manual, DOT physical schedules, safety data sheets, equipment and vehicle maintenance schedules as well as companywide announcements. This was extremely helpful for communication during the constant changes and impacts caused by COVID-19.

We have team members who have been with us more than 30 years who thought this new tech was going to be far worse than what they knew and felt comfortable with. Instead, many have come to us and admitted that it is remarkably simple, saves them time and they would never want to go back. Industrial Resolution has significantly improved our processes, time and costs with this new automation.



Forging a Path Toward a Data-Driven Culture

By William Cotten, Innovation Leader, Impetus

Impetus was established to move the construction industry forward. Frustrated by antiquated industry norms and eager to pioneer a better way of creating the built environment, our founding in 2013 challenged the status quo and signaled a changing tide for the construction industry.

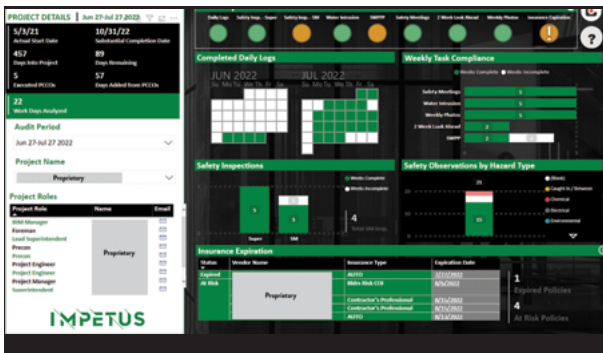


Figure 1. Impetus data analytics dashboard

Since our formation, we have relentlessly pursued new ideas, explored emerging technologies and discovered better ways of building. Aligned with this mission was our commitment to establishing a digital strategy and investing in innovative technologies and methodologies.

Starting with the formation of our Digital Transformation team, we convened a cohort of novel thinkers from across the organization—with representation from IT, virtual design and construction, finance, self-perform, operations, preconstruction and field personnel.

Together, we have embarked on a mission to drive our digital strategy toward adding real value throughout the organization. To date, we have built a modern tech stack that is supported by a fully cloud-based infrastructure, integrated critical programs to optimize operations and addressed virtual communication through relevant social technologies.

ABC AWARDS AND ACKNOWLEDGMENTS

- ▶ 2021 National Excellence in Construction® Award
- ▶ 2021 Accredited Quality Contractor
- ▶ 2022 Top Performer
- ▶ 2022 STEP Diamond

Recently, Impetus introduced data analytics into our organization in pursuit of developing leading key performance indicators and enabling data-driven decision-making. This effort began with a strategic hire of an analytics engineer: an individual proficient in navigating data engineering and developing analytical models. Equipped with this new skillset, we have embarked on a strategy to organize data compliance standards and criteria, train and support end users on data stewardship and collaborate with business unit leadership to develop agile models that provide real-time KPI insights and historical analytics.

Leveraging our core technologies and a business intelligence solution in Microsoft Power BI, we are developing dashboards to gain real-time insights into jobsite safety and risk compliance, operational KPI tracking, financial forecasts, business development opportunities, prefabrication/design for manufacture and assembly product development and historical data models. These tools have unlocked a new knowledge base and a means of analyzing business processes that fosters continuous improvement and yields better results.

The future of the construction industry will require learning to do more with less. Faster schedules, tighter budgets, long-lead material procurement and manpower shortages are becoming commonplace, and all companies are being challenged to adapt to these conditions. At Impetus, we believe innovative ideas and technologies—combined with the right digital strategy—provide a competitive advantage and push the evolution of the industry toward breaking new ground.



Safety Resources in the Palm of Your Hand

*By Eric Impraim, Director of Information Services,
and Amy Schwager, Senior IS Support Analyst,
Forrester Construction*

Forrester Construction is an award-winning general contractor offering clients construction management, preconstruction and design-build services. Located in Rockville, Maryland, we are a locally owned leader in the Washington, D.C., metropolitan market with a proven record of construction excellence, client satisfaction and cost-effective project delivery. We are proud to have been recognized with over 290 industry awards and have established many relationships with repeat clients and long-term subcontractor partners.

Forrester partnered with Maryland Occupational Safety and Health in the Strategic Partnership for Excellence in Construction Safety Program that was spearheaded by the ABC chapters of Maryland. We were the second general contractor to be recognized and the first to reach Level 2 in the program. As a leader in Level 2, we naturally thought to lean forward with technology and designed not only one but two safety apps to enhance our safety tracking and reporting.

The main objective of our safety program is to provide the safest possible working environment, drawing upon best practices and continually analyzing what we do and how we do it. Our leadership at all levels, including upper management, is accountable for creating and maintaining a total safety culture, which insists upon safe working conditions for Forrester team members and all workers on every Forrester project. A safe working environment is extremely important to us and one of our core values. We never cut corners on safety.



Figure 1. A contractor uses a safety app on a jobsite

ABC AWARDS AND ACKNOWLEDGMENTS

- ▶ 2020 National Safety Excellence Award
- ▶ 2021 National Excellence in Construction® Award
- ▶ 2021 Accredited Quality Contractor
- ▶ 2022 Top Performer
- ▶ 2022 STEP Diamond

We were challenged to streamline the process of capturing and reporting data from our Safety Compliance Program and consolidating all safety resources to a single location for easy access and use. We looked to technology to provide a solution to this challenge. It needed to accomplish the following:

- Obtain an analysis of real-time data for stakeholders to make decisions faster and to manage changes that prevent accidents and injuries onsite
- Provide easy, on-demand processes and resources to respond to safety incidents on site
- Provide critical data for the safeguarding of evolving working conditions that introduce new risks
- Track safety program project requirements and objectives (whether teams are conducting site inspections, surveys or toolbox talks)

The resulting two safety apps developed by our IT team and safety committee facilitate the collection of safety data and consolidate all digital safety resources in one place, accessible by all team members directly from their mobile devices.

The safety apps contain the following components:

- Forrester Safety Compliance Checklist Survey
- Forrester Safety Manual
- Active list of trusted safety vendors, suppliers and materials
- Third-party and OSHA inspection procedures
- Jobsite incident response procedures
- Material safety data sheets and binder



Figure 2. Safety app on the display of a mobile device

The following parts of our safety program can be recorded in the apps:

- Daily jobsite inspections to ensure compliance with each project's site-specific safety plan
- A safety compliance checklist survey is utilized as a guide for each inspection; all noncompliant observations are entered into the survey and tracked to correction
- A biweekly review of safety data with owners and external stakeholders
- Daily toolbox talks are performed and recorded in the safety app to ensure subcontractor partners are aware of safety protocols around the work being conducted on site
- A monthly review of current data and initiatives at board and management committee meetings
- A monthly review of safety data at safety committee meetings to review the effectiveness of our safety programs and identify opportunities for improvement

The result is a simplified data collection and reporting system that accurately records observations and generates reports and trends across all jobs. In addition, safety resources are automatically kept current and up to date in the background without intervention from the user. The benefit of this innovative solution is multifold: Observations can be made in real time and the safety checklist and tracking of project safety plan objectives/requirements can be collected and monitored from a centralized place.

We attribute much if not all of our success to the training and empowerment of our team members and building partners on our projects. Through its ease of use, real-time data collection and on-demand availability, the Forrester safety apps have drastically simplified our safety recording, data analysis and monitoring system. Our team members are not tied to paper or a computer to complete their inspections and checklists, ensuring that each employee works safely.



Figure 3. A Forrester project executive using an app on a jobsite

Thinking of implementing a new technology?

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Improving Efficiency Through Building Information Modeling

By Russ Gibbs, VP, Director of VDC, Innovation, and Operational Technology, Brasfield & Gorrie

Reduce material waste and rework. Increase understanding of a project through visual planning. Identify potential clashes before they occur. Speed up turnaround times. Increase communication efficiency and overall project understanding. Improve manufacturing and trade contractor assembly. Boost employee morale.

Those are all desirable outcomes on any construction project—and building information modeling aids in all of them. Although it was introduced to the architectural, engineering and construction industry more than 15 years ago, companies are adopting this technology at different rates, and getting started can be daunting. Some companies mistakenly believe that BIM is a tool you can simply take off the shelf to make an immediate impact on your business. In reality, it's a collaborative process that can be implemented throughout design and construction.

Through trial and error, companies have learned they must take ownership of implementing BIM. At one time, software companies and tech partners were great starting points, but now the industry and the trades are shaping the narrative around what makes BIM successful.

These steps will help you successfully implement BIM within your organization.

Plan

General contractors should lead the process and guide everyone on the team to a successful BIM implementation strategy. A general contractor should provide:

BIM Implementation Plan—A detailed explanation of the process, this plan clearly defines the responsibilities of all parties.

Coordination Schedule—A schedule defining the scope of work and key sign-off dates. This must be integrated into the overall master project schedule.

Project Kickoff Meeting—A weekly meeting with all major contributors included in the BIM process.

- General contractor attendees: project managers, MEP managers, superintendents, BIM managers
- Trade attendees: project managers, superintendents, BIM managers, modelers

Sign-Off Process—A specific sign-off process for areas determined in the coordination schedule. Models, drawings and signatures should be included and uploaded to the project file storage.

ABC AWARDS AND ACKNOWLEDGMENTS

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Collaborate

Design-team 3D models are a point of reference, not intended for construction, and they are typically obtained by signing a waiver because many designers want to relinquish responsibility for sharing 3D models. That's OK and shouldn't kill the process!



Figure 1. A contractor scans a QR code

It is the general contractor's responsibility to request these files and issue them to the rest of the team. Each trade is then responsible for establishing a 3D model scrubbing process, which involves comparing what you received in a 3D format to the 2D construction documents. Each company must then decide whether to inherit or recreate the 3D model's content.

We see both options regularly, and a decision may be informed by the value the 3D model brings to your organization. The decision to recreate is generally based on a desire to use the 3D model for more than clash detection.

Companies use 3D models in numerous ways:

- 80% for clash detection
- 72% for as-built documentation
- 65% for hanger layout
- 45% for fabrication and spooling

Requesting the design team's model isn't a one-time thing; continue to request updates throughout the construction process. Changes that are issued through an RFI or addendum are generally shown in 3D models as well, often in advance of being added to the issued drawing sets. Knowing that these changes are coming helps with productivity and communication.

It's also wise to involve the design team in your process, such as including them in weekly calls. As they see the team's diligence, they will quickly become part of the process themselves, answering questions more quickly. Their trust will increase productivity for the entire team.

Activities				Modeling	Coordination		Shop Drawings	A/E Review	Fabrication
BIM Scope	Area	B&G "Pull" Task	B&G Pull Date	BIM Starts	Coord. Starts	Drop Dead Sign Off Date	Issue Shop Dwg		
U/G Work	Underground	UG	9/26/2022	6/29/2022	7/6/2022	8/23/2022	8/2/2022	8/9/2022	8/30/2022
A/G Work	Level 2	L2 OH	9/29/2022	7/13/2022	8/3/2022	8/26/2022	8/30/2022	9/6/2022	9/27/2022
A/G Work	Level 3	L3 OH	12/22/2022	8/10/2022	8/31/2022	11/18/2022	9/20/2022	9/27/2022	10/18/2022
A/G Work	Level 1	L1 OH	1/2/2023	8/31/2022	9/21/2022	11/29/2022	10/18/2022	10/25/2022	11/15/2022
A/G Work	Level 4	L4 OH	1/6/2023	9/28/2022	10/19/2022	12/5/2022	11/8/2022	11/15/2022	12/6/2022
A/G Work	Level 5	L5 OH	1/24/2023	10/19/2022	11/9/2022	12/21/2022	11/29/2022	12/6/2022	12/27/2022
A/G Work	Level 6	L6 OH	2/27/2023	11/9/2022	11/30/2022	1/24/2023	12/20/2022	12/27/2022	1/17/2023
A/G Work	Level 7	L7 OH	3/8/2023	11/30/2022	12/21/2022	2/2/2023	1/10/2023	1/17/2023	2/7/2023
A/G Work	Penthouse	PH	4/8/2023	12/21/2022	1/11/2023	3/7/2023	1/31/2023	2/7/2023	2/28/2023

Figure 2. BIM coordination schedule

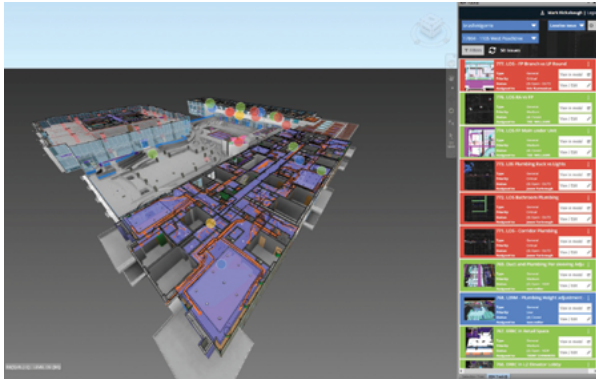


Figure 3. BIM Track report

Communicate

Collaborative decisions made throughout the BIM process speed the teams' communication, and it's essential to establish documentation processes to capture this information. Changes that critically impact the project—such as changes to systems, structures, price or life safety—must always be submitted as a formal RFI and logged in your project management platform.

Capturing the dialogue of the BIM coordination process is also important and may solve hundreds of issues a day that do not require an RFI. Companies including Autodesk, Procore, Revizto and BIM Track are emerging to capture this dialogue and ensure transparency. Choose platforms that integrate with your existing workflow to make it easy for decision-makers to participate in the process. Make sure to develop a hierarchy for communication and an approval process. Nothing is better for communication than participation!

Implement

Don't lose sight of why you're implementing BIM in your organization—to support your field employees' process. That isn't possible until you share the models with your field teams.

There are several methods to do so, and those we recommend include:

- Autodesk Forge and QR codes
- Autodesk BIM 360
- Procore model viewer

General contractors must also plan installation sequencing. A general contractor's ability to hold all trades responsible for installing according to the BIM plan is crucial to everyone's success. If trade contractors coordinate and manufacture systems offsite, the process can be disrupted if a system is installed out of sequence.

Though implementing BIM requires buy-in across a team, its benefits can make the investment worthwhile.



Model review example



BIM execution plan

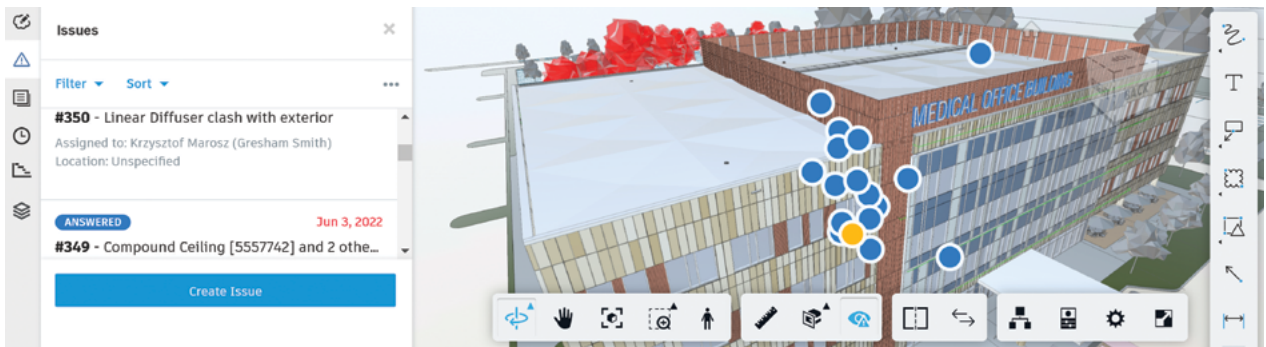


Figure 4. BIM 360 example



Poole Anderson

Project Management Technology: Perspective From a Mid-Size General Contractor

*By John Lehmann, Senior Vice President,
Poole Anderson Construction*

Choosing the right project management tools for your company can prove to be one of the most important yet challenging things you will do to mitigate risk and achieve success. The following factors should weigh into your decision in finding the right solutions to fit your needs:

- Technology strategic plan/goals
- Management needs
 - Accounting and interface with project management software
 - Project management software
 - Scheduling
 - Field operations
- Evaluation process
- The power of peers
- Return on investment
- Budgeting/pricing structure/add-ons
- Implementation and research and development
- Customer service
- Post-implementation

It all starts with a strategic plan. Every business should have a strategic plan that includes technology needs. We developed a technology plan with the goal of finding products that are versatile, flexible and integrate with each other.

Technology is not one-size-fits-all and a single product may not solve all your needs. Identifying what is most important to you for each part of your business is critical. If you are looking at a project management tool, how effective the documentation flow works and its ease of use for all project stakeholders are a top priority, i.e., document control, RFIs, submittals, daily reports, etc. We chose Procore as our project management software, but it does not solve all our needs. Some of the products we have chosen to meet our technology needs are:

- Procore: Project management and field operations
- Primavera P6: Scheduling
- Brigit: Manpower tracking
- BlueBeam: Document coordination, estimating
- Sage 300: Accounting

Each of these integrates with our Procore system and allows us to seamlessly run projects as well as the operations of the company.

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- ▶ 2021 Accredited Quality Contractor
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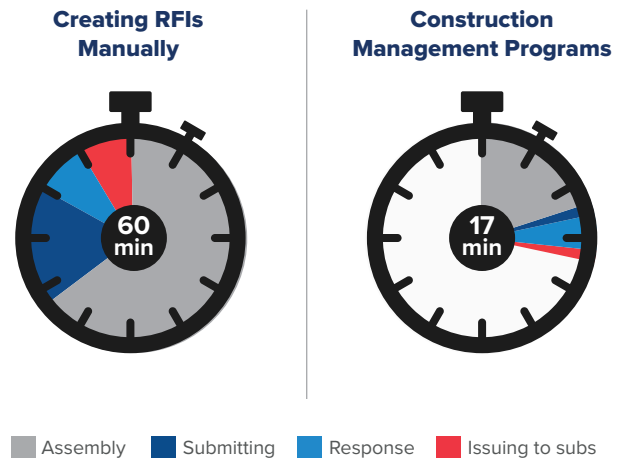


Figure 1. ROI comparison

The evaluation process to identify the right system starts with the plan and continues with the detail. We create a diverse team with a point person in charge to lead the process. We then develop a matrix of what the systems offer and the pros and cons to determine which will best suit our needs. Some of the high-level criteria we use to evaluate the products for includes:

- Cost
- Benefit
- Functionality
- Aesthetics
- Ease of use

We also find it helpful to visit the vendors at conferences that we attend like those held by Associated Builders and Contractors and the Construction Leadership Network. Getting input from our peers at these organizations provide a tremendous advantage during this process.

Determining the return on investment of a product may prove to be a difficult task depending on the product and the need. It may not be the driving reason to choose a tool—for instance if it may be required by your clients for their projects. Quite often the ROI can be found in the products' efficiencies and the risks that can be mitigated by using it, i.e., having a system that provides real-time documentation to all the trades so that everyone is working off the same revisions of documents.



Figure 2. UKI Procore drawings screen UI iPhone and iPad

This can avoid quality issues and disastrous delays due to rework requirements. One of the ROI benefits of Procore was the amount of time it took us to complete a complex RFI, using various tools like Excel, email, Dropbox, etc., compared to utilizing the power of Procore that has all the document control within the system (Figure 1). All parties are immediately notified of the RFI and its status and history are tracked within, making the process superefficient.

Putting together an annual budget for your technology needs will help you determine what you can afford or are willing to invest in technology resources. The pricing structure is critical to your assessment of a product. Typically, your negotiation will be based on a multiyear deal as well. It is important to determine what comes with the system and what are add-ons. Add-ons are fine; in fact, we have added Procore BIM for 3D modeling and analytics (Figure 2) for dashboards and analysis of our performance across all project management functions. Some factors in determining costs are:

- Project volume: What happens if it increases or decreases?
- Your revenue: What happens if it increases or decreases?
- How is it determined? Software companies will look at a project as a straight-line revenue as opposed to the bell curve that's typical to construction.
- What is the annual increase and what is the increase potential after the contract has expired?

Implementation is key to a successful launch of any solution. The designated point person takes the lead with the technology team to spearhead the process. Involving various departments that will either use or be affected by the technology is also critical to gain important input as well as keep your team informed. When purchasing a product, ask as many questions as possible about how the implementation works and if they have time and resources estimates and lessons learned based on prior implementations.

Often companies will have the flexibility to allow collaboration during and after implementation to allow you to add your personalized requirements. During the implementation process, customization can be done for things like templates and reports to meet your needs. (Make sure you discuss customization abilities during the evaluation phase.)

Often the best tech companies are ones that provide exceptional customer service. This needs to be evaluated when making your decision. Systems can be complicated and often you won't find the true showstopper issues until you are well into its use. Ask how they operate and request other client references. What's been helpful to us in the past is reaching out to our industry peers who have implemented the same systems or similar systems and had lengthy discussions about the product and lessons learned. You can save a tremendous amount of time and aggravation by doing this.

The post-implementation process should include initial and continued training and implementation of updates, enhancements and add-ons. The success of your technology plan is also contingent on designating the right personnel to manage it and supporting them.

Technology is expanding and changing at the speed of light and can be complex and confusing. Hopefully some of these steps will help you along your journey.

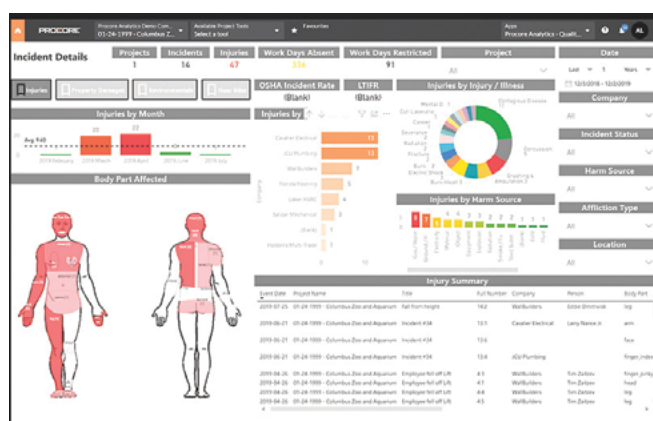


Figure 3. Procore incident details dashboard



Total Equipment Management

*By Kent Killion, Safety and Field Operations,
E-Z Construction*

As a part of a growing construction business, it means I wear many hats and do what needs to be done to keep E-Z successful. To ensure our team is operating efficiently across the board, our equipment is a major focus, and I needed to leverage modern equipment management technology to improve business and implement a system that would work for our team.

Because we are constantly moving equipment between locations, equipment tracking and management were a challenge for us. Additionally, last-minute changes or repair needs made it difficult to manage our assets on paper. When looking for the right technology, we found Tenna, our construction-focused equipment management platform. Tenna has modernized the way we work and keeps us efficient so we can focus on business growth.

While technology adoption can be a culture shock for some teams, the system has been a good fit for us, as it is customized to our needs. We have experienced the value of Tenna across the board as we continue to develop our use of the platform.

Every day, I leverage Tenna to locate equipment and see where our drivers or foremen are. And because all of our equipment is tracked on Tenna's single platform, we can see everything: from our excavators, bulldozers and skid steers, down to our smaller hand tools, generators and pumps.

Improves Field Operations and Communication

We're seeing huge benefits with equipment management in the field, especially around location tracking and dispatching. Employees are constantly looking for tools and equipment, so instead of sending a text to everyone in the company, they can simply go to our Tenna app and see where it is (or at least record of the last place it was). This creates a timesaving benefit and eliminates the need to go searching.

We are also able to move equipment more efficiently. We can plan our moves and determine logistical order depending on current locations and schedules.

Because of the fast pace and complex nature of construction projects, visibility into field operations and communication between the field and office can be a challenge. As the primary liaison between the two, it's tremendously helpful to leverage technology



Figure 1. E-Z Construction excavator

that enables us to see the same, accurate data to avoid communication gaps and surprises.

Using quality hardware ensures that we gain accurate data capture from the assets themselves and can assess the subsequent automation of that data into the platform. Because we use a construction-specific platform, most of that data is already aggregated into reports, lists or charts for us to easily analyze.

The mobile app is convenient in the field and the desktop version is easy for office staff. Since our teams have different use cases for Tenna—depending on their roles—that helps us stay connected.

Utilization for Job Costing and Equipment Acquisition

One thing I like from the office standpoint is job costing. We set up geofences around our sites and within our sites to track equipment usage. Additionally, equipment hourly tracking is automated, which is more efficient and accurate.

At the conclusion of the job, we're able to analyze how well we estimated the equipment usage. If estimates are off, it affects overall job cost. The data from Tenna allows us to review usage and determine if we estimated equipment usage properly. This helps future projects as it allows us to tighten numbers based on actual utilization.

Accurate utilization is key for us to make decisions around equipment acquisition and disposal. Whether we need to purchase new equipment or remove something that isn't utilized, we can make informed decisions about our fleet. Our industry continues to face supply chain issues and challenges around new or rental equipment, so this functionality is increasingly valuable.

Summary of Value

Ultimately, using this technology helps us prevent higher job costs by improving utilization and eliminating hoarding; plus, we have more efficient dispatching, which saves time. Equipment operations are complex and it's important to have a system that's industry-focused, understands usage and can scale as our business grows.

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