

7 Ways to Use Technology to Help Bridge Your Construction Labor Gap

A practical guide for growth-minded construction contractors facing labor and talent challenges.



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To understand the state of commercial construction today, it helps to start with two data points:



In 2022, construction workers enjoyed the highest real-wage growth of any sector in the country. The wages of every other sector, except finance, declined in 2022.



The construction industry posted 383,000 help wanted openings in April 2023, up 68,000 from a month earlier.

These points are not surprising. They underscore the special challenge facing project managers, field engineers, superintendents, foremen and front office leadership in navigating a rocky time for the construction business. The glimmer of rising wages has proved to be of modest help. Finding and keeping good people goes beyond a quick fix, no matter how well-intended the training, marketing or compensation program.

The good news is, if any industry knows how to survive, it's construction. Who else routinely completes projects from scratch with so many constraints on time, materials, staffing, budget and logistics?





More with less? It's a way of life in construction.

Even so, general and specialty contractors constantly look for ways to tilt the playing field to their advantage. For many, that means muscling up digitally.

Digital automation already factors hugely at the work site and in the office. Think of the smartphone, tablet or laptop computer. They're business essentials.

But what about other automation? Dodge Data & Analytics reported that over a third of all specialty contractors plan technology investments to lift productivity, led by mechanical contractors. This playbook looks at the what, how and why behind the surge to automate layout and reality capture workflow.

How does digital technology act as a force multiplier? What do other contractors think? How does digital automation help address the whipsaw effects of hiring workers while skilled talent heads into retirement or elsewhere?

Technology is not a silver bullet. But it may be the next best thing to it for an industry wrestling with labor shortages, skill gaps and relentless margin pressure.

Meet Suzy

Christopher Goodale doesn't know what he would do without Suzy. Goodale is a project manager for the CM Company, a widely respected construction management and general contracting company based in Idaho. The 46-year-old firm specializes in commercial projects for public and private sector clients. Goodale is also the firm's VDC manager.

And Suzy? That's the name the company christened its pride and joy: a robotic total station manufactured by Leica Geosystems.

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We're working on a tilt-up warehouse. In a few minutes, I'm taking Suzy out to lay out the walls and snap lines. Suzy is critical to project quality and schedule. We assist our trades with the layout of everything from footings and embeds to the walls.

CHRISTOPHER GOODALE
Project Manager for The CM Company

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A robotic total station uses a single operator to measure angles and distances electronically, providing precise position coordinates. It automates construction layout and is especially useful for specialty trades such as concrete and MEP (mechanical, electrical and plumbing).

“We’re working on a tilt-up warehouse. In a few minutes, I’m taking Suzy out to lay out the walls and snap lines. Suzy is critical to project quality and schedule,” Goodale explained. “We assist our trades with the layout of everything from footings and embeds to the walls.

“For example, we give our plumbers a layout of every one of their underground fittings, with a pin marking each fitting location. It easily cuts plumbing time in half.”

Goodale highlighted a distinct difference between that project and one from a previous week when a schedule conflict prevented Suzy from tagging along. “We had to work with a mix of lasers, framing squares and levels. I’m thinking, ‘We need Suzy here!’” Goodale recalled. “I know this

is how layout was done for decades. It felt so inaccurate and slow. It took three guys to do what Suzy and I could have done faster and better.”

Today, more and more general contractors (GCs) and specialty contractors are investing in their own robotic total stations. But as Nate Bush can attest, the transition from tape measures, plumb bobs, 4-foot levels and analog transit comes with its share of emotion and anxiety. Bush, a 27-year veteran of concrete construction for industry leader Baker Concrete Construction (BCC), is now a building construction sales engineer for [Leica Geosystems](#). He served on the front lines for thousands of pours, from old-school workflow to the latest digital technology.

“I look back now and wonder, ‘How did we get anything right with a tape measure?’” Bush said. “Dan Baker, the BCC founder, was never shy about investing in technology. Other trades would see our robotic total stations and ask if we could help them out by throwing them a few points to work with. The robotic total station’s speed and accuracy is obvious to everyone.”





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NATE BUSH

Construction Sales Engineer for Leica Geosystems

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A Swipe-and-Tap Revolution

For labor-strapped contractors, digital tools that help streamline workflow couldn't have come at a better time. What makes next-gen total stations, laser scanners, field software and even prism poles so potent in the workforce conversation isn't just their capability, which is impressive, but their contractor-friendly design and simplicity.

Layout

Tom Trotter, a line and grade manager for [Baker Concrete Construction](#), was recently surprised by the power something as basic as a prism pole now packs. "It's the next wave for faster layout. What we tested is a game-changer," Trotter reported, referring to the new [Leica AP20 AutoPole](#) smart prism pole system with tilt compensation, which allows you to measure and layout points without leveling the pole. "We could work around rebar, forms, you name it," Trotter said.

"Leveling the rod is half the battle," Bush agreed. "Being able to move the tip around to get extra data is huge. You can even flip the AP20 upside down and shoot the ceiling."

The system also automatically updates the pole height within the Leica iCON field software every time you change the height (to capture points around obstacles, etc.), and it has built-in intelligence to quickly lock on to the right target and stay locked on.

As a result of these capabilities, Bush conservatively estimates a 50% savings in layout time, which translates to a significant boost in productivity. "That's not just laying out the elements, but also capturing that topo, capturing the slab edges," he said. "It cuts the time in half, at least."

Reality Capture

Laser scanning for reality capture is another area of rapid advancement. Reality capture has proved to be a boon for architects, engineers, GCs and subs — anyone who needs as-built data capture, no-dispute certainty, say, for pursuits, dispute resolution and progress tracking. Scanners were once large, clumsy, difficult-to-operate beasts that took ages to complete a scan. No more. “Scanning hardware and software have dramatically dropped the bar,” said Ted Moberg, reality capture specialist for Leica Geosystems.

For example, the fastest laser scanner available, the Leica RTC360, is so easy to use that beginners are often proficient with just an hour or two of training. A single person onsite can capture data and HDR imagery in minutes, that used to take hours for a crew of two to three people. The high-density, high-quality scan data is automatically pre-registered in the field onboard the system, making it fast and easy to take the data into your CAD program.

Compact and handheld imaging laser scanners are also providing significant productivity advantages by making it simple to capture real-world conditions for construction coordination, clash detection, progress documentation, and other purposes.

How has new technology altered the job site? Here are seven ways digital automation is helping erase the yawning workforce shortage and skills gap.



7 Ways Technology Helps Attract and Keep Construction Talent

1. No Experience. No Skills. No Problem.

The Bureau of Labor Statistics says nearly half of construction workers are 45 and older, a demographic time bomb. As operational talent ages and retires, who picks up the slack? Even now, a shrinking talent pool is causing some GCs to turn down work, said Kris Manning, chief operating officer for Maryland-based Clark Construction.

The new breed of technology may help change that trajectory. “There’s a vast misconception about the difficulty of laser scanning,” Leica’s Moberg cautioned. “An architecture firm once challenged me to prove scanning simplicity. I gave the practice’s three newly hired interns a 20-minute step-by-step tutorial on scanning operation. The next day, the interns captured their first floor plan. The firm’s principal was convinced. Another myth shattered.”

2. Rapid Reskilling

The previous illustration speaks to quick onboarding. But what about reskilling? Repurposing skilled trade pros for a digital future is a rising priority. Baker’s Trotter said the company recently added an electrician to one of its three robotic total station crews. “He had done some layout for MEP but never concrete,” Trotter explained. “He was kind of worried when he first started. We gave him a 3D model, some drawings. Just click on the model, I told him. No math required. He figured it out quick.”

3. Workflow Accelerator

The idea of automating long-established manual tasks such as layout might seem intimidating to some. Bush knows the feeling firsthand from his Baker days: “We knew we had to make the leap to digital layout. We really didn’t know how we’d put it into our workflow. We just pulled the trigger. In no time at all, we realized this is a huge time saver. We had so much information within a matter of minutes. There was no turning back.”

4. All-Digital Safety

Moberg knows the risks contractors will take in the name of measurement accuracy. “Safety is a huge issue on any work site,” he said. “Scanning means no ladders, lifts, or risking life and limb to get that dimension. Let the laser do the work. A tape measure over a great distance is accurate to plus or minus a quarter to half an inch. A laser? It’s plus or minus a millimeter or two with no falling risk.”

5. Subcontractor-Friendly

On the job, the work of a scanning or digital layout team doesn’t go unnoticed by other trades. CM Company’s Goodale has seen the shock and awe it causes. “I overheard a conversation between a mechanical contractor and our superintendent. The contractor said, ‘Man, I need to do more CM jobs. You make this so easy. You’re doing half the job for us.’” That kind of buzz gets around, making it easier to line up high-demand trade partners.

6. Forward-Looking

Investing in technology is a vote for the future. Conversely, stubbornly sticking with old ways sends a different kind of message to staff.

“I have a friend who left a company because they didn’t embrace technology,” Moberg said. “He knew he wasn’t going to get a raise or a bonus because the contractor was always running behind schedule, stuck in old-school practices.”

7. Recruiting Magnet

Winning the recruiting wars requires new outreach strategies to break down misconceptions young people might have about the business. Contractors like CM Company let the technology speak for itself. “We have a booth at job fairs. We bring our hardware and talk through the tech. We are a popular booth. Young people like what we’re doing with technology,” Goodale reported.

Trotter knows the power visuals have for a graphics-first generation. “I’ve used software from all the top names. They all have pluses and minuses. I have to say Leica iCON software is brilliant in how simple and easy it is to use. It’s like the developers said, ‘Let’s find the easiest way to use this.’ That’s what they did. The software is as basic or as advanced as you want.” Leica’s Moberg put it bluntly: “We assume the person who uses our equipment and software has zero information. How can we help that person succeed?” And Bush added, “iCON software thinks like a contractor. There’s no fancy survey lingo. It’s all about construction.”





A Final Thought

It's difficult to convey all the ways digital technology can echo through the life of a contractor. Some are expected: leapfrog gains in speed, accuracy and safety. Others less so: confidence in the knowledge this is the only realistic way forward for you, your company and the industry.

Contractors that feel the bite of being shorthanded, people-wise and skill-wise, are alert for any advantage. Especially now, with infrastructure dollars poised to flood project pipelines, the idea of a workforce multiplier is more attractive than ever. Today, digital muscle may be de facto foundational for anyone looking to claim their share of public sector business. Meanwhile, BIM (building information modeling) construction is quickly emerging as the standard in vertical and, increasingly, horizontal construction projects.

The idea of transitioning away from a familiar workflow is a big decision. It's not lightly taken, emotionally or financially. Bush said it well: "Everyone has their own journey." In many respects, it's a journey we've all made before as communications, computing, manufacturing, entertainment, banking ... well, you name it ... has made the digital evolution.

As you weigh your options, consider teaming up with a technology partner skilled in helping contractors make the transition to simple, surprisingly easy-to-use digital layout and reality capture tools.



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