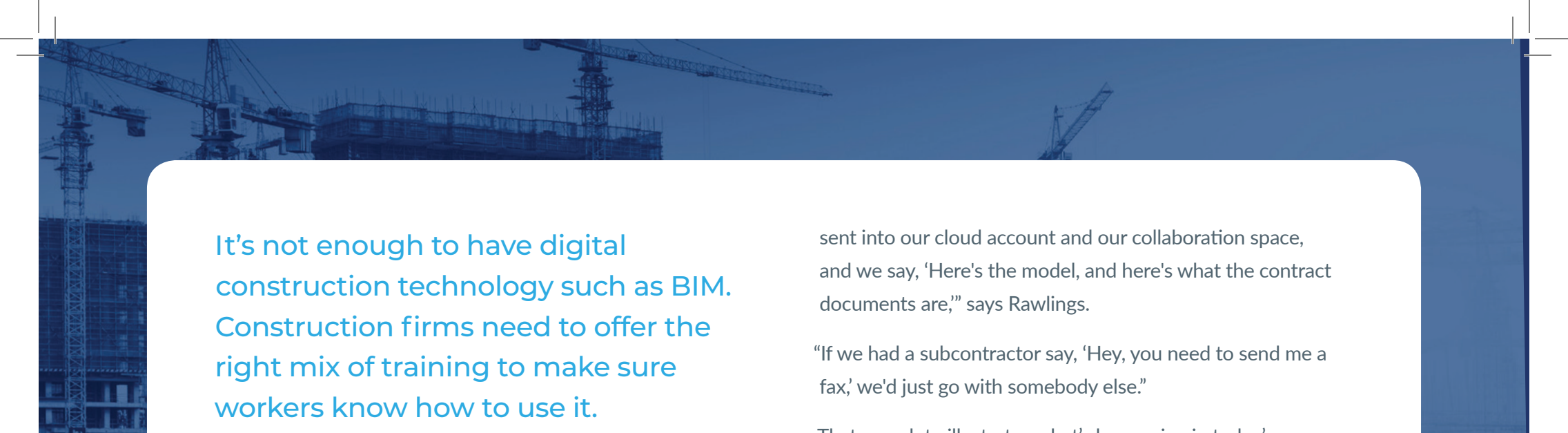


Four Digital Construction Technology Skill Sets

FOR BETTER PROFITS, EFFICIENCY AND RETENTION



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It's not enough to have digital construction technology such as BIM. Construction firms need to offer the right mix of training to make sure workers know how to use it.

Over the past decade, Blake Rawlings, construction information manager for Okland Construction, has seen a massive shift in the way construction firms manage projects. Gone are paper blueprints, drawings and highlighters. His field workers are plugged into the cloud on mobile devices, using building information modeling (BIM) and other digital construction technology tools to visualize, manage and track jobs. That is, when he can find workers with the proper training.

"Ten or 15 years ago, we would send the plans to subcontractors, and now we send them the PDF. And on some of the new projects that we're working on, they're

sent into our cloud account and our collaboration space, and we say, 'Here's the model, and here's what the contract documents are,'" says Rawlings.

"If we had a subcontractor say, 'Hey, you need to send me a fax,' we'd just go with somebody else."

That anecdote illustrates what's happening in today's construction industry. In short, the industry is in the midst of a disruptive shift in technology that demands a new generation of tech-savvy workers. Unfortunately, workers with those tech skills are increasingly hard to find.

Contractors who have not mastered these technologies have a major handicap. Digital construction technology, including BIM, gives AEC professionals the insight and tools to more efficiently plan, design, construct, and manage buildings and infrastructure. These technologies can significantly improve site coordination, cost and schedule control, safety and quality assurance.

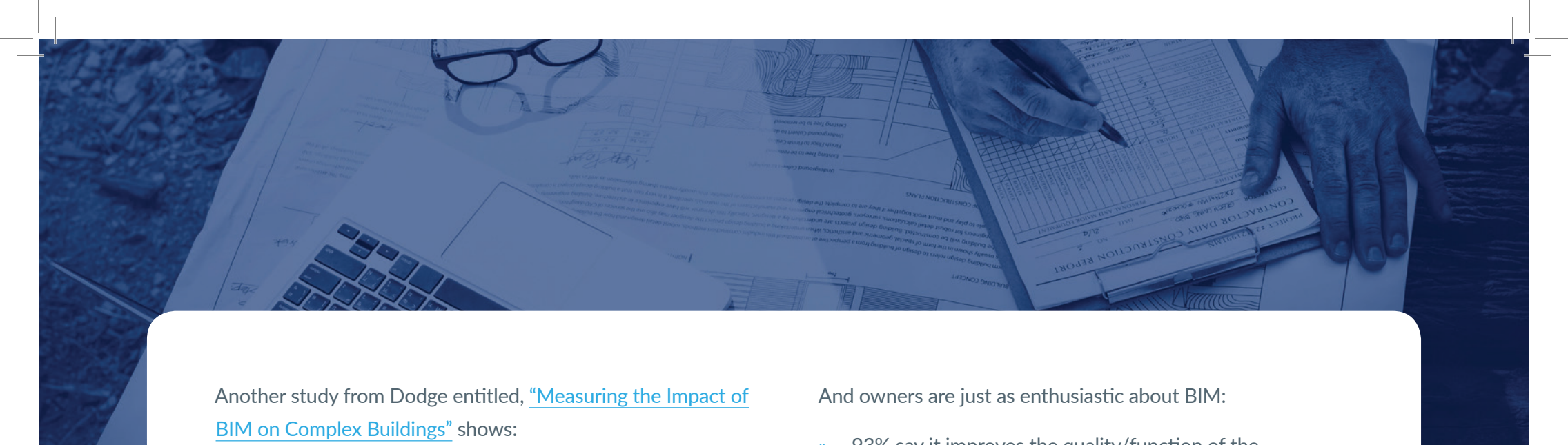
BIM BENEFITS

Research shows why pros such as Rawlings are so bullish on BIM.

According to a Dodge Data and Analytics/Autodesk report titled, ["Leading The Future Of Building – Connecting Design and Construction:"](#)

- » 60% of firms give BIM top rating for improved communication during the entire design-detailing-fabrication workflow, as well as faster/better coordinated designs and shop drawings.
- » 58% say BIM leads to fewer field installation errors, which has enormous implications for reducing rework and material waste, along with improving productivity and schedule compliance.





Another study from Dodge entitled, [“Measuring the Impact of BIM on Complex Buildings”](#) shows:

- » 74% of contractors say BIM improves constructability of the final design.
- » 71% of engineers say it improves quality/function of the final design.
- » 85% of AEC pros say BIM results in a reduction in the final construction cost.
- » 88% of AEC pros say BIM leads to accelerated job completion.

And owners are just as enthusiastic about BIM:

- » 93% say it improves the quality/function of the final design.
- » 73% say it increases their understanding of proposed design solutions.
- » 70% say it generates better construction documents.
- » 70% say it improves their ability to plan construction phasing and logistics.

Michael Moran, a director at Telos, a digital construction consultancy, says that “using digital construction technology such as BIM improves the quality of the overall project, while reducing the risk of delays and late handovers. All of those are practical outcomes that improve project delivery.”

BIM WORKER SHORTAGE

But while the benefits of BIM are unmistakable, many contractors have yet to embrace the technology. Regardless of the reasons why contractors haven't gotten the training, there simply aren't enough contractors with BIM skills to meet the demand for BIM-related work.

"It's extremely hard to find someone who understands how to work in a computer and also knows construction," Rawlings says. "We've got a lot of professionals who know how to model and use the program, but they don't know anything about how things are built."

His experience is backed up by studies such as the Dodge Data and Analytics/Autodesk report, which shows:

- » More than 50% of AEC pros cite finding BIM-skilled personnel as a major challenge.
- » 63% of trade contractors report that they must use outsourced BIM services to help fill this gap.

Contractors are not the only group that is lacking the skills to collaborate with other professionals in building projects. The study also shows:

- » 50% of the high-engagement architects require BIM from MEP (mechanical, electrical, plumbing) and structural engineers.
- » More than 80% of high-engagement GC/CMs require BIM from MEP and structural steel trades.

"Lack of BIM-skilled talent may influence the degree to which engineers generally lag contractors in BIM use and involvement in the integrated workflow," the study's authors write. "As BIM requirements proliferate, the industry needs to help these firms become more proficient."



FOUR BIM SKILLS SETS THAT ATTRACT AND RETAIN NEW WORKERS

As BIM-related skills become more commonplace — and, increasingly, required — the industry needs more workers who can bridge the gap between the technology and actual building experience.


“You’ve got a lot of professionals coming out of school that know how to model and understand how the program works,” Rawlings says. “But they don’t know anything about construction and how things are built. What we need in the industry is for people who have construction experience to learn the software and the technologies for BIM. When you have people who know how to build, teaching them how to build virtually [will lead to] a more constructible model.”

What technology skills should contractors look for as they hire new workers? Experts say there are essentially four digital technology skill sets today’s construction employees need to know. They also say offering training around these skills helps contractors to attract and retain new workers — especially millennials. That’s crucial because 78% of construction firms say they are having a hard time filling both salaried and craft positions, according to the Association of General Contractors.

1. SYSTEM ADMINISTRATORS

These are the workers who build the technology systems that are the foundation of your BIM-enabled workforce. That's why Moran and others say system administrators need intensive training in the software they'll be deploying across the enterprise. Fortunately, manufacturers readily offer such training, including certification in specific programs such as REVIT. This high level of training typically comes with a steep learning curve. "It's not for everyone," Moran says.

In addition to setting up systems, administrators are responsible for configuring, tweaking and maintaining the systems enterprise-wide. When choosing systems, Moran says many companies make the mistake of only looking at the licensing costs, without considering the cost of hiring and training administrators. "It needs more investment and time than people realize in the beginning," he says.



"[BIM] needs more investment and time than people realize in the beginning,"

MICHAEL MORAN
DIRECTOR AT TELOS



2. COORDINATION, CONSTRUCTABILITY AND DESIGN COLLABORATORS

Once the systems are set up and ready to go, companies need people who can build the models for constructability and collaborate with designers. These are some of the hardest workers to find because they not only need to be skilled — and, ideally, certified — in BIM systems, but they also need to have some construction experience.

“There are so many things to look at when building something that a person straight out of school doesn’t know,” Rawlings says.

To ensure a steady source of in-house coordination, constructability and design collaborators, Okland offers regular lunch-and-learns of 30 minutes to an hour that train

interested workers in the tools available and how to use them. The company reimburses workers who want additional training or certification. Rawlings says simply offering such training has been enough for Okland to maintain a technology-savvy workforce. “The guys who don’t know how to use the technology are asking for the training because they know it’s a requirement, so they’re eager for it,” he says.

“There are so many things to look at when building something that a person straight out of school doesn't know,”

BLAKE RAWLINGS
CONSTRUCTION INFORMATION MANAGER
FOR OKLAND CONSTRUCTION



3. DEPLOYMENT SPECIALISTS OR INFORMATION MANAGERS

Even the most robust and valuable technology is only as good as the people using it. That's why this third level of skill worker is so vital to organizations. Sometimes called superusers, these are the workers who know the technology tools inside and out — and can help their fellow workers navigate the system when needed. They're the people field workers go to when they have questions.

Moran and others say companies often overlook this crucial role and sometimes don't even have a job title associated with it. "A lot of companies fail to provide the proper training for these folks," Moran says. They don't understand that they need a superuser "who can evangelize and get buy-in for the system from others. It's not just click here, or click there, but bringing them over to working in this digital way."

Moran says younger workers who are more comfortable with technology often fill this role naturally. However, workers who are helping others without compensation while trying to keep up with their own jobs can quickly get burned out. "They're often overworked, overstretched and pulled in a million different directions," Moran says. They may go looking for a job with a company that has the job title that matches the work. "If you don't have that role defined, you'll be playing catch up with companies that do," he adds.

Along with creating a job title, Moran says it's important to develop clear, understandable processes, as well as centralized procedures and standards that don't change when a person leaves. This must be built into the organization. "Ultimately, you need to create headcounts and departments that provide digital support and standard roles on projects," he says.



4. FIELD USERS

Once the foundation is built for technology, it's time to roll it out to field users. These are the people who will be using the systems to do their jobs. And though it may seem obvious, companies need to take special care in ensuring they know how to do them. Moran recommends creating short instructional videos for each process.

Okland offers a specialized "training matrix" to field workers in the specific systems they'll be using. For example, the training teaches workers who will be using BIM 360 exactly how to navigate the models on the iPad, along with how to see recent activity and identify user changes.

"We sit down with the project managers, and we go over the technologies that we're using on their project and the trainings that are available for it," Rawlings says. "Everybody on the project has to go through those trainings."

Finally, it's important to have a point person who can answer questions on the fly. Some companies even have a hotline that workers can call to get immediate answers.

"You don't need a hundred experts on every project, but everyone needs to understand what their responsibility is in the digital process," Moran says. "It has to be made quite clear and simple what everyone has to do. If you do that, you'll be successful."

THE TRAINING EDGE

When it comes to digital construction technology such as BIM, the systems themselves are almost secondary to having the right mix of training and skills to use them. Companies that recognize the importance of training for these skills will not only gain a competitive edge over the competition, but they'll also be more likely to hold onto workers.

"It shouldn't be that BIM and technology are in the hands of a few people," says Moran. "It's just a matter of time before everyone on a project will have access into those systems. We're finding that a lot of companies are setting up networks and tools that can be accessed anywhere. But the question they're asking themselves is, 'Do we have a training program that teaches them how it works?'"



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