AUTODESK CONSTRUCTION CLOUD™

Winning with Digital Preconstruction:

Combining 2D and 3D Workflows for Faster, More Accurate Takeoffs

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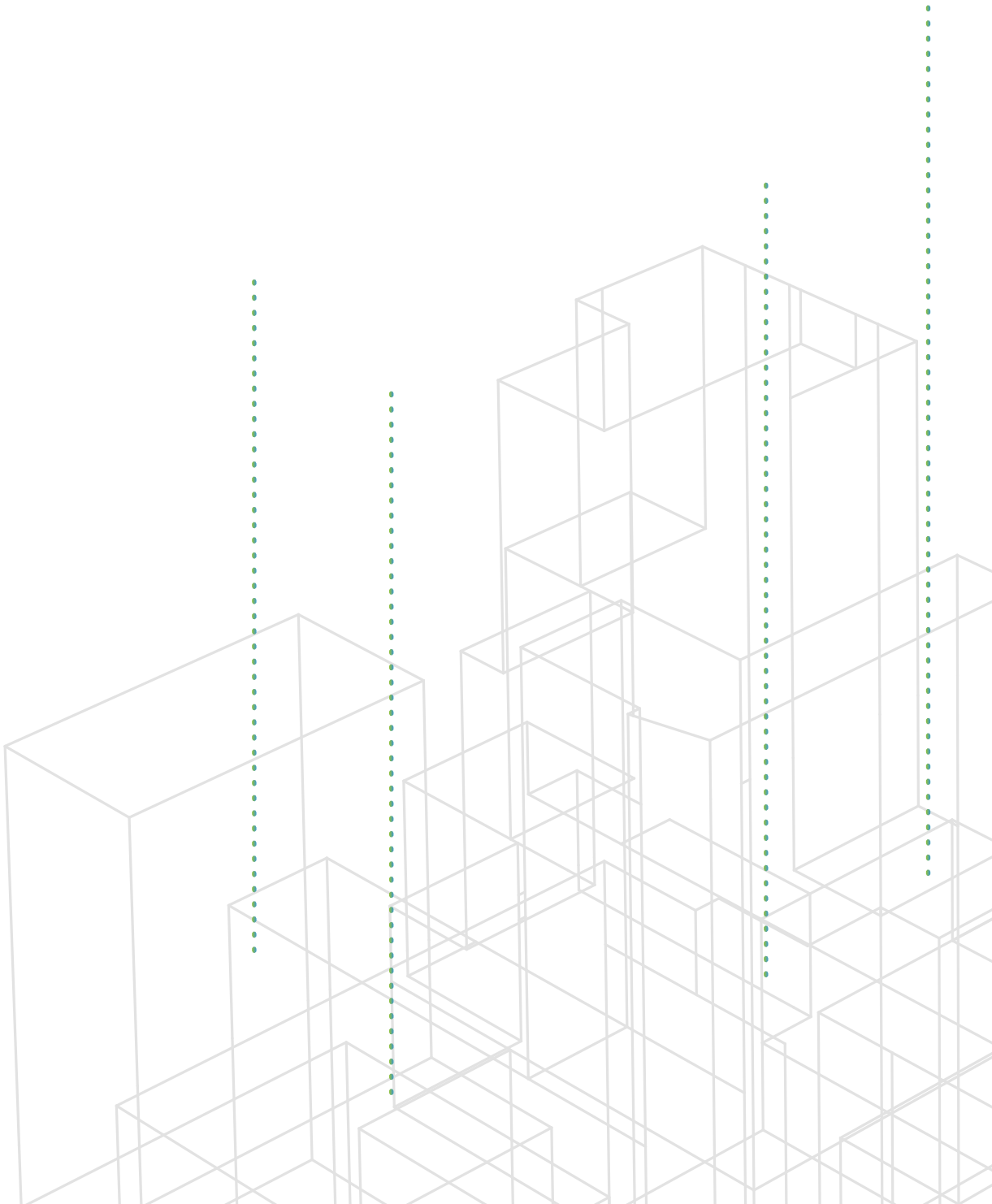


Introduction

The construction industry is rapidly transforming. According to a survey by AGC and FMI, 58% of construction professionals expect to see more technology-driven change within the next five years than there has been in the last 50 years. To stay ahead, preconstruction teams must adapt to the industry's digital future.

To better understand where they stand today, we surveyed over 1,000 preconstruction professionals about their relationship with technology. With only 37% of respondents reporting that they're taking full advantage of the preconstruction software available to them, it's clear that successful digital transformation requires more than purchasing software.

When asked about the biggest roadblocks to adopting new technology, the #1 answer was interrupting current projects and objectives (24%), followed by resistance to adoption by end users (18.2%) and lack of training (15.9%). Still, teams recognise the value of making a change: 62% of respondents agreed that adopting new technology leads to more successful outcomes, and 63% believe that adopting new technology will give their company a competitive edge.

There's also a gap between individual and organisational desire for change. Preconstruction professionals look to technology to improve the way they work: 74% of respondents said they're open to learning about software that will help them do their jobs more effectively. However, only 18% feel their company is eager to adopt new software.

Facing these challenges, what does it take to achieve digital transformation in preconstruction, and more specifically, in workflows like quantification? There's no quick fix or easy solution, but by focusing on three key categories—technology, people, and process—teams can maximise the value of their digital solutions and further unlock the benefits of BIM within their organisation.

Spotlight

Skanska

Skanska is a world leader in construction and project development throughout the Nordic region, Europe, and USA. Kelsey Stein, National Preconstruction Technology Manager at Skanska, recently shared how incorporating 2D and 3D models for quantity takeoffs has saved her team both time and money on projects.

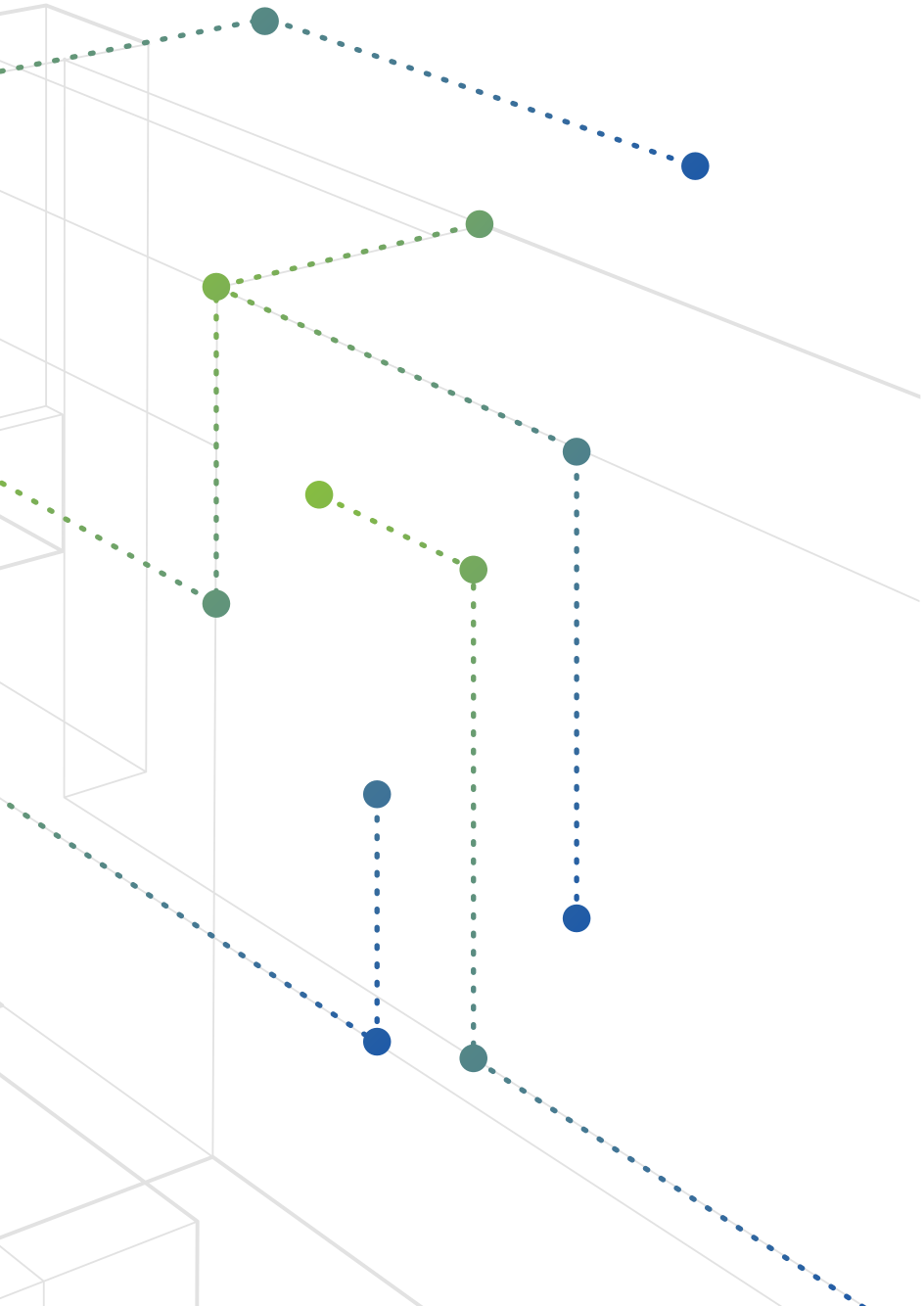
"One of the biggest challenges we faced when moving to a web-based 3D solution was the pushback we received internally," she said. "We overcame this by proving the value of the new tool through real-life cases. For one project, we did both a traditional 2D takeoff and a 3D takeoff. In the 3D takeoff, the curtain wall scope was 28% larger than the 2D takeoff, and the instant reaction was that the 3D takeoff had to be incorrect. By digging deeper, we found that those quantities were missed in 2D. This saved us an enormous amount of money that we would have lost if we had followed the traditional 2D method."

By using 3D modeling, the team has reduced the amount of time that they spend quantifying a model, which in turn saves money on the project. They're also able to provide greater value to the client because they're spending less time on manual work and more time focusing on important issues like constructability, safety, and sustainability.

Digital Transformation in Quantification:

Technology

Traditional ways of handling quantification don't identify most of the problems that lead to delays and over-budgeting until late in the construction process. Siloed construction technology inhibits collaboration and leads to slower, less accurate takeoffs. With cloud-based technology teams can work confidently and quickly, knowing they're accessing the same documents and information and updating their team members in real time. This helps them create more accurate takeoffs, and identify issues earlier. **An effective takeoff solution should be intuitive, easy to adopt, and create company-wide standards that streamline processes for all team members.**



The Importance of an Integrated Strategy

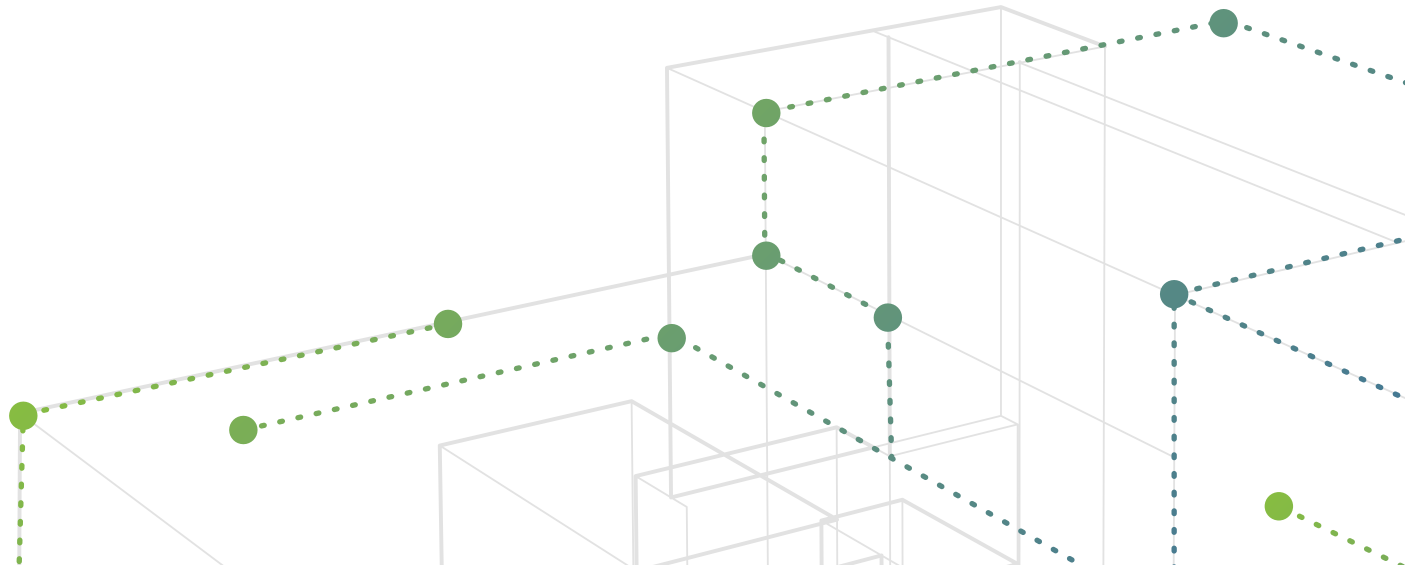
Siloed information has always been a frequent problem within quantification. Collaboration is critical to any project's success, and when information is siloed across teams, it is easy to lose key data points. From issues with version control on documents to a lack of visibility across teams, people make mistakes, and time gets wasted.

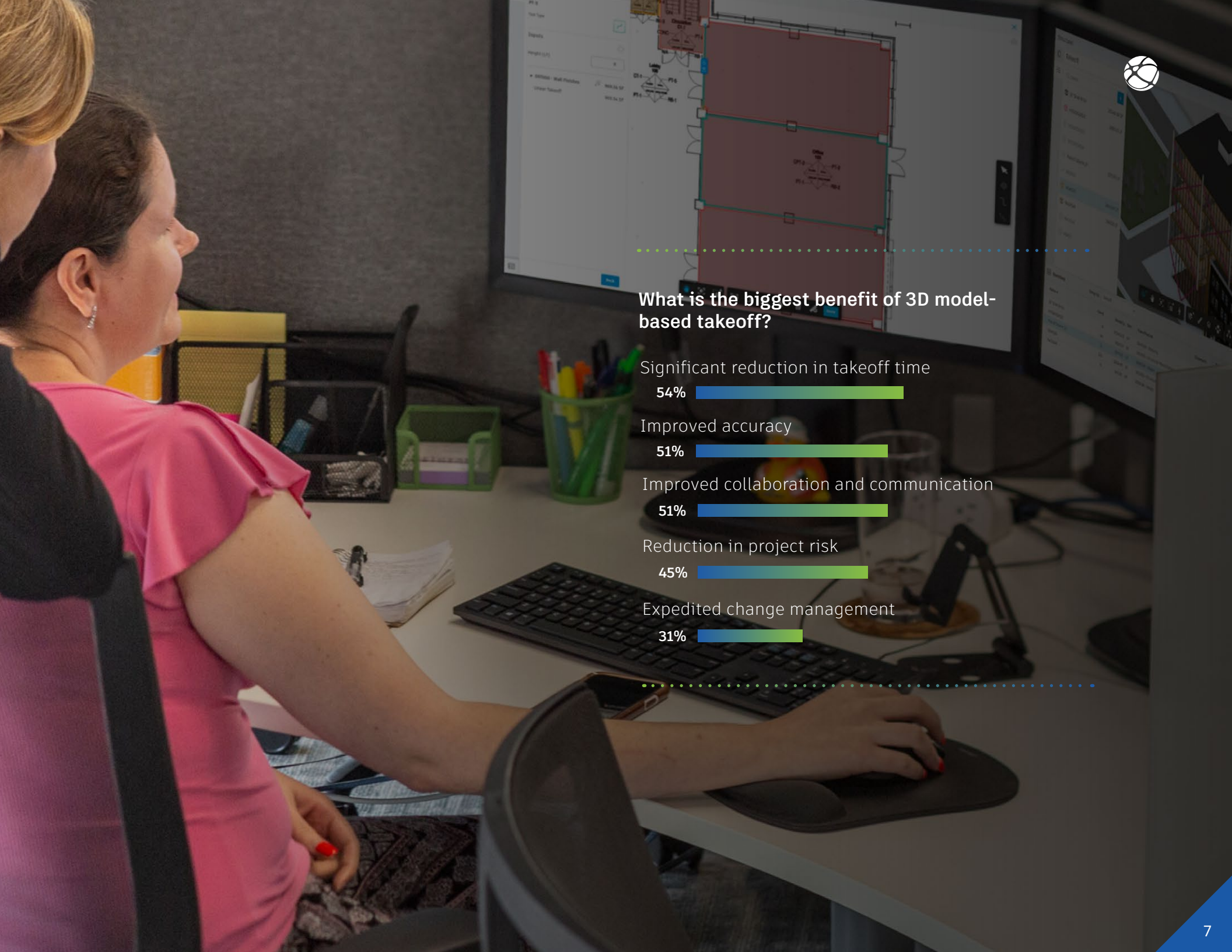
That's why an integrated strategy that drives accurate estimation and scheduling must begin during the earliest stages of planning. With an accurate picture of project scope and sequence, teams can win more bids while also remaining successful during the actual execution of the project.

Moving to the Cloud

Web-based solutions also help solve these common issues. Subcontractor numbers can be checked in real-time against quantities contained in the model, helping teams create more accurate budgets. Collaborative platforms allow for stakeholder engagement, with fewer bottlenecks throughout the quantification process.

Beyond internal collaboration, the right technology makes it easier to share information with external teams. With more confidence they'll deliver on promised timelines and budgets, teams can win more work.





What is the biggest benefit of 3D model-based takeoff?

Significant reduction in takeoff time

54%

Improved accuracy

51%

Improved collaboration and communication

51%

Reduction in project risk

45%

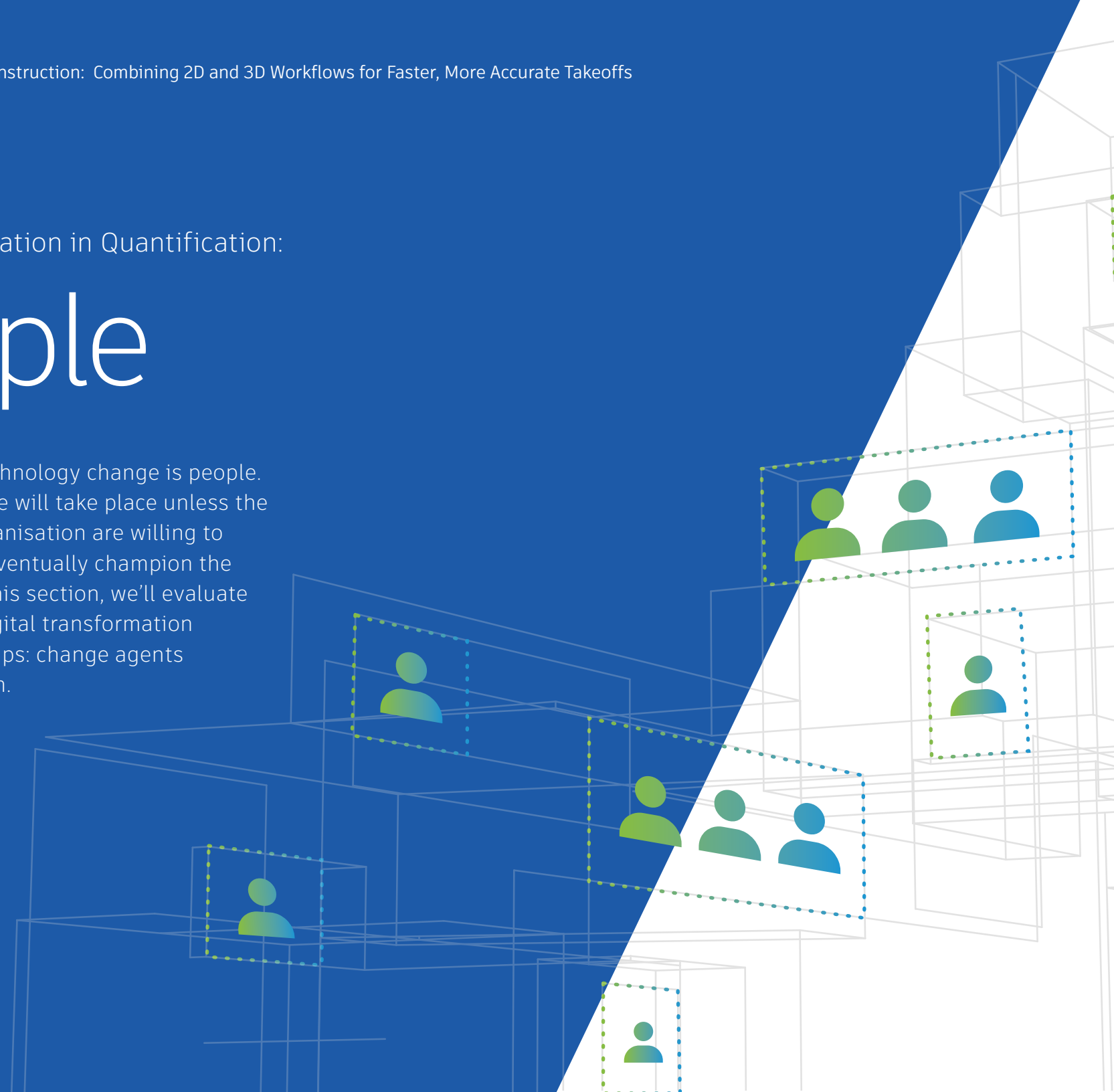
Expedited change management

31%

Digital Transformation in Quantification:

People

At the core of any technology change is people. Simply put, no change will take place unless the people within an organisation are willing to engage, adopt, and eventually champion the new technology. In this section, we'll evaluate the people side of digital transformation through two key groups: change agents and an adoption team.



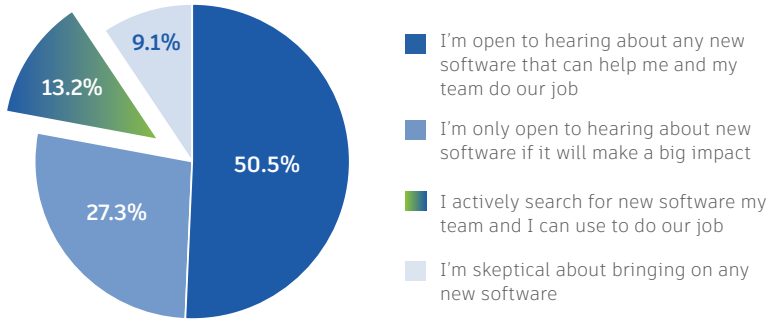
Becoming a Change Agent

First and foremost, for change to take place, there must be someone pushing to make it happen.

When surveyed, 13.2% of preconstruction professionals reported that they actively search for new software to make existing processes better. These are the change agents in an organisation.

Which of the following statements do you most agree with?

ALL RESPONDANTS



Change agents have a unique opportunity to own the process of digital transformation for their workflow. This involves fully understanding the need, and then advocating for a change with leadership. The initial change agents will build out the structure for adoption of new technology, then help bring supporters (50.5%), neutral participants (27.3%), and skeptics (9.1%) on board.

Adoption Groups

Adoption of new technology begins with the change agent mapping out the new process and identifying the people who need to adopt the new technology. Ideally, this will start with winning over key leadership. The right sponsorship will ensure that adoption is driven across the entire organisation.

According to an industry dive into the adoption of BIM technology, 38% of users adopt new tech when a colleague trains them or tells them about a new tool. This bottom-up approach is critical when looking to implement an organisational change. If key influencers in an organisation champion the change, others are more likely to follow suit.

Building out a network of change champions across teams can help influence key stakeholders throughout the organisation. Look for early adopters who are willing to provide honest feedback through a pilot stage. These change champions can then help drive the adoption of new technology throughout later stages of implementation.

Overcoming Resistance

Not only will it be vital for the change agent to identify key stakeholders who are willing to adopt new processes, but it will also be critical to identify those who will be agents of resistance within the organisation. Rather than focusing on the skeptics as a negative, it is important to focus on the following aspects of their resistance:

- What are their fears?
- What are their previous experiences with technology adoption?
- What awareness do they have of the benefits of technology?
- What benefits will they gain from the change?
- What knowledge will they need to effectively navigate the change?

In many cases, those who are most resistant are simply unaware of the need for change. They might not understand the benefits and might feel incapable of navigating a new process. For example, a lack of BIM expertise was cited in our survey as one of the most significant challenges across disciplines in adopting new quantification technology. This highlights the importance of widespread training when rolling out a new solution.

Implementing technology can also leave those who once felt competent in their job feeling insecure and worried about their future capabilities. Address these concerns, emphasising that new tools are there to free users from manual, tedious tasks—not replace the expertise they bring to the table. Then, equip change-resistant colleagues with training that will make them feel more confident navigating the new solution. These simple steps can help skeptics move from aversion to enthusiasm.

Spotlight

Joeris

Joeris, a Texas-based regional contractor, went through their own growing pains when adopting new technology. They incorporated a web-based 3D solution alongside their existing 2D technology to improve the use of model data in preconstruction. This tool now drives increased collaboration and has shortened its preconstruction timeline.

However, their adoption strategy evolved through trial and error. The first lesson Joeris learned in their initial attempt at implementing new technology was that their estimators needed to be the ones empowered to drive change. This shift allowed the company to activate change through key influencers within the organisation.

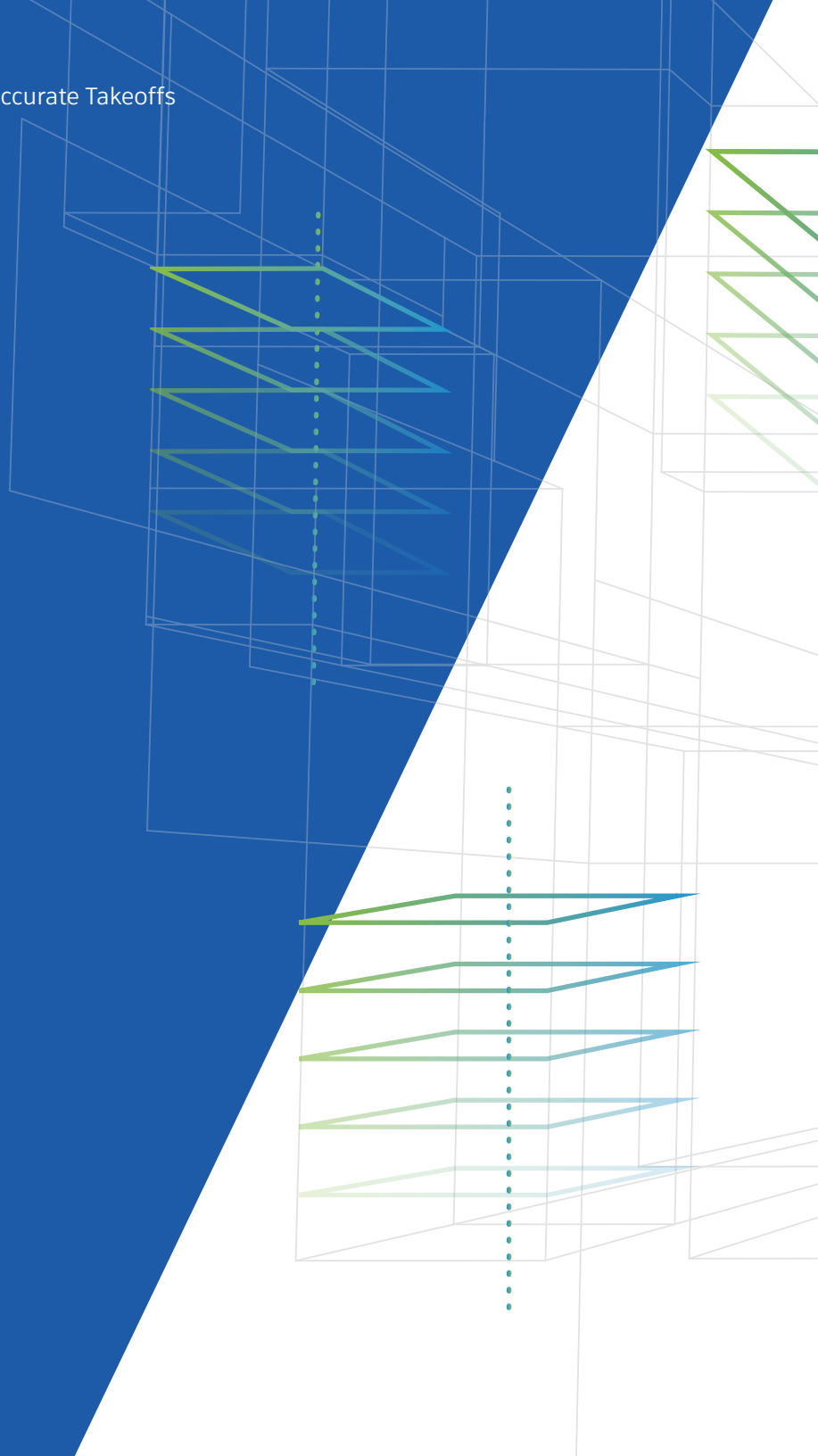
The second lesson that Joeris learned was to move away from one-size-fits-all training and toward a more proactive, one-on-one coaching method. They learned that handing out a tool without the right training strategy in place is ineffective.

While Joeris utilised key influencers to help lead their transformation, they also focused on providing information to executive leadership to strengthen support for the change. They showed leadership how the process would result in improved efficiencies and, ultimately, a more collaborative team approach.

Digital Transformation in Quantification:

Process

Once the people side of change has been accounted for, it is time to focus on process. The right solution should make existing processes more seamless, from internal collaboration to external communication with clients.



Spotlight

McCarthy Building Companies Inc.

McCarthy Building Companies Inc. recognised their need for improved technology during the preconstruction phase due to the amount of time they were spending accessing model files, pricing out the models, and then getting those files back to project owners for review.

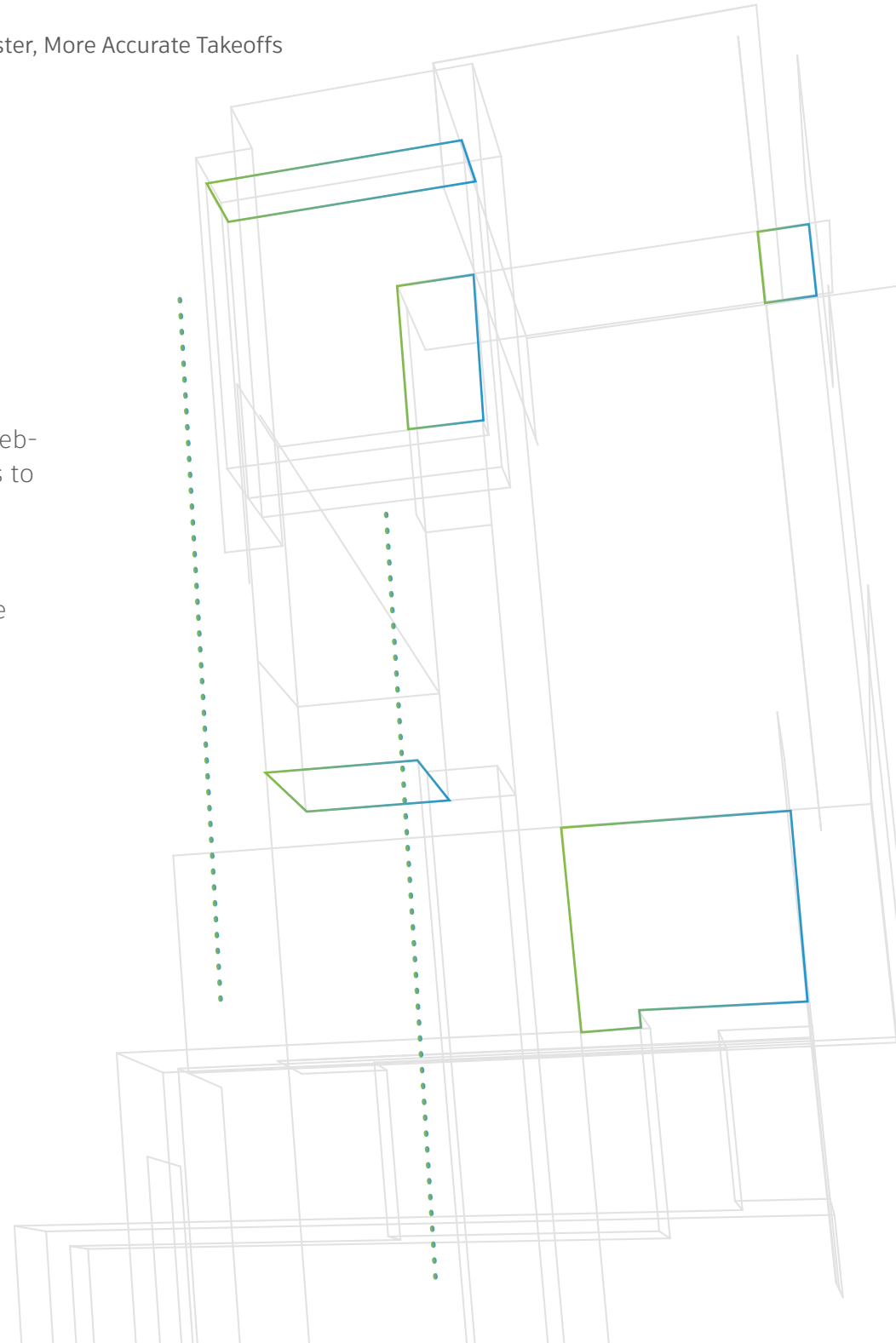
Turning to the integration between design and quantification solutions, McCarthy realised that the adoption of new technology would allow their teams to collaborate in real-time in a shared space. This saved time in design development and across everyone's workflow. Project estimators had quick and easy access to files, allowing for faster estimates with greater accuracy in value refinements.

McCarthy chose new technology not just for the sake of new technology, but rather because they carefully vetted a system that would provide real-time collaboration that led to efficiency and accuracy improvements in their workflow.

Conclusion

Reducing risk, improving collaboration, and staying on schedule are a few of the many benefits teams can get from upgrading their quantification process. Opting for new technology that provides a web-based approach to model conditioning is key for any firm that hopes to remain competitive in today's construction landscape.

While implementing change is never without challenges, the right strategy that focuses on both the people and process side of change can ensure the best long-term adoption of new tools. Countless experiences from main contractors demonstrate how change is not only possible, but also highly beneficial for all teams involved in the preconstruction process.



See the Future of Connected Construction

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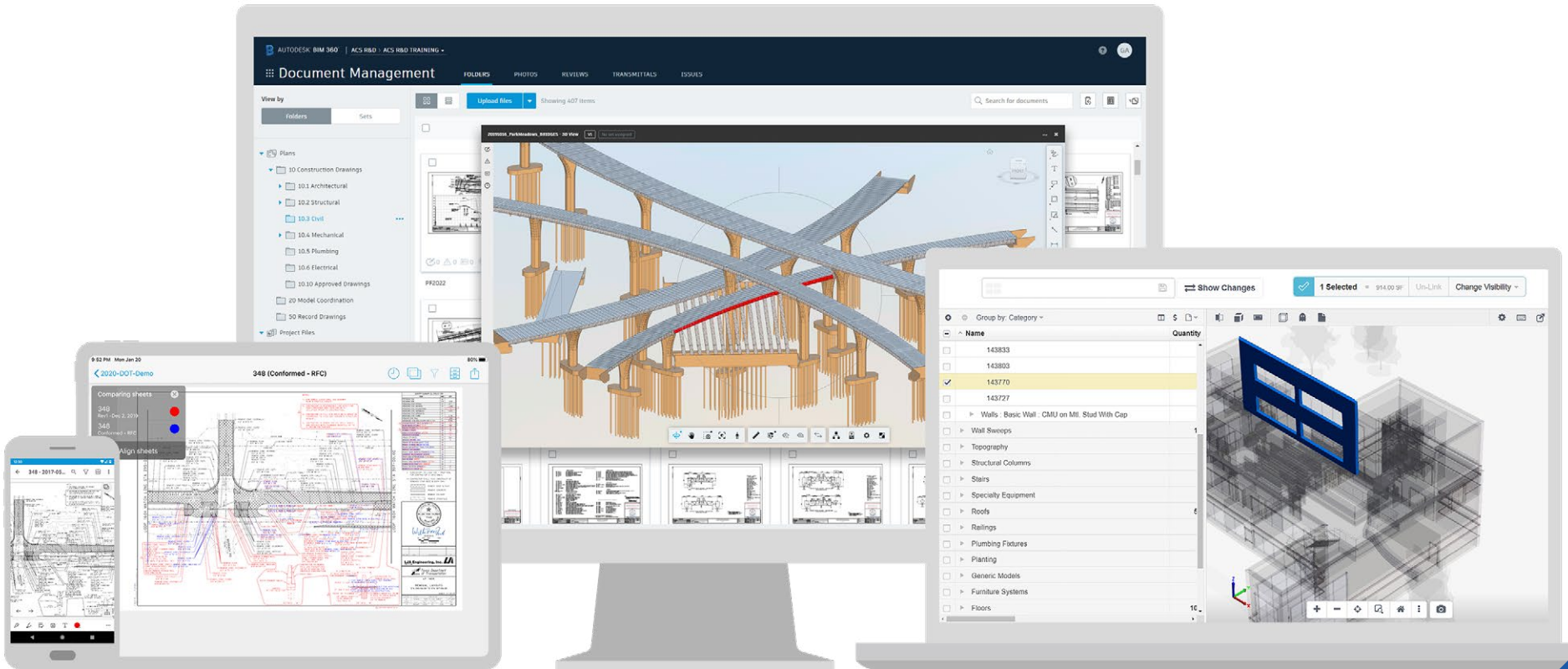
In 2018, Autodesk announced that construction would be a key focus area to help our customers on their design and make journey. To capitalise on the opportunity, Construction became its own CEO-staff level organisation, Autodesk Construction Solutions. This unique structure is comprised of product development, customer success, marketing, and field operations. The organisation is designed to move at the speed of the market and serve customers on a level playing field with other solution providers. Autodesk Construction Solutions offers products that cover the entire construction lifecycle, from design through plan to build and operate, including the Autodesk Construction Cloud which brings together our cloud-based solutions Assemble, BIM 360, BuildingConnected and PlanGrid.

Our vision is to create a vibrant construction industry where predictability and productivity are exponentially increased, while construction site waste is proportionately reduced. The time has come for platform that will empower an industry transformation. Our mission is to help construction teams meet the world's rapidly expanding building and infrastructure needs, while making construction more predictable, safe and sustainable.



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United States
+1 (866) 475-3802
construction.autodesk.com

Australia & APAC
AUS +61 1800 314 435
acs.apac@autodesk.com
construction.autodesk.com/au

UK & EMEA
+44 808 1892 253
acs.emea@autodesk.com
construction.autodesk.com/gb