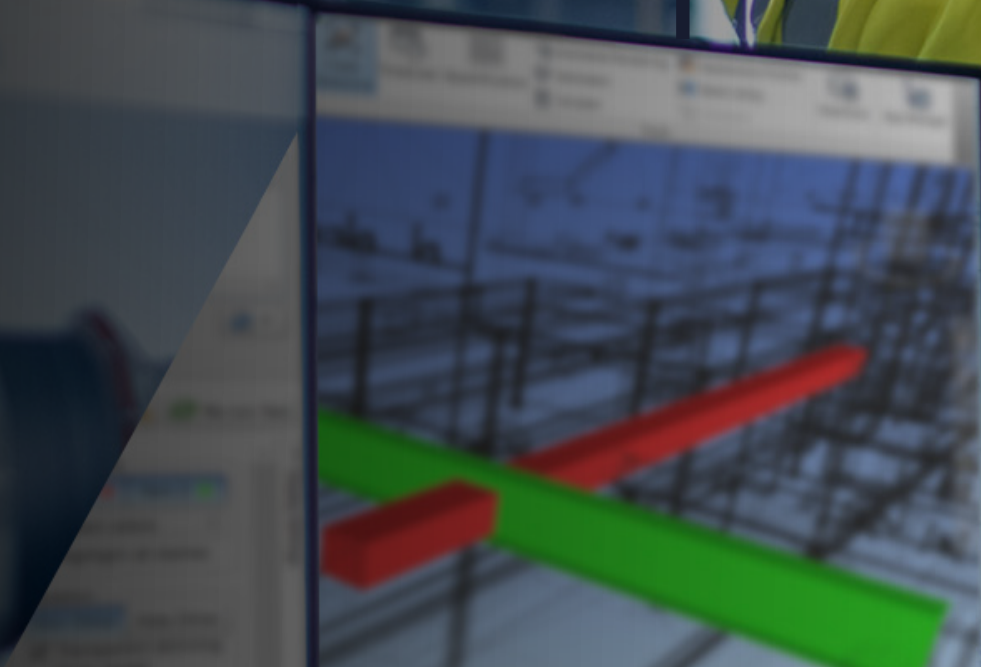


A general contractor's guide:

Unlock a smarter way of working with virtual design and construction workflows.





72%

of construction companies worldwide identified digital transformation as a key priority.

Source: IDC/Autodesk report

Introduction

As construction projects become more complex and the lines between traditional phases of construction – design, plan, build, operate – continue to blur, general contractors are taking on more risks as well as responsibilities.

These changes necessitate a new way of doing things, particularly in the early stages of a project.

The industry is not only ready for a digital transformation, it is already in the process. And what does this mean for you, the general contractor? In order to stay competitive, you need keep up with this digital transformation by adopting technologies like Building Information Modeling (BIM) and cloud-based workflows for virtual design and construction (VDC).



“Technology is transforming the way buildings and infrastructure are designed, constructed and operated. At BAM International, we have made a good start on our digital journey, and we need to keep moving to stay ahead of the industry.”

Patrick McKinney, Director, BAM International, Middle East

Value of a common data environment

More and more, the design and plan phases of construction happen simultaneously. A general contractor therefore needs a common data environment (CDE) to capture data as it is created across different teams early in the design process. And the data captured in a CDE during design and plan can be accessed and used throughout the project lifecycle – benefiting field teams, fabricators, and building owners.

Working in a CDE alongside stakeholders during the design phase reduces risk down the line. By adopting and expanding your use of BIM and design collaboration tools, you can provide a more accurate and reliable picture during the design and plan phase.

You can deliver on three key business value drivers by working in a CDE during these early phases:

Improve project quality with less rework in the field

Exercise better control over project schedules and costs

Win more work and build a project pipeline through competitive differentiation

How can Autodesk help?

Autodesk provides a connected platform of end-to-end construction solutions. Start digitizing your construction processes and establish a CDE by:

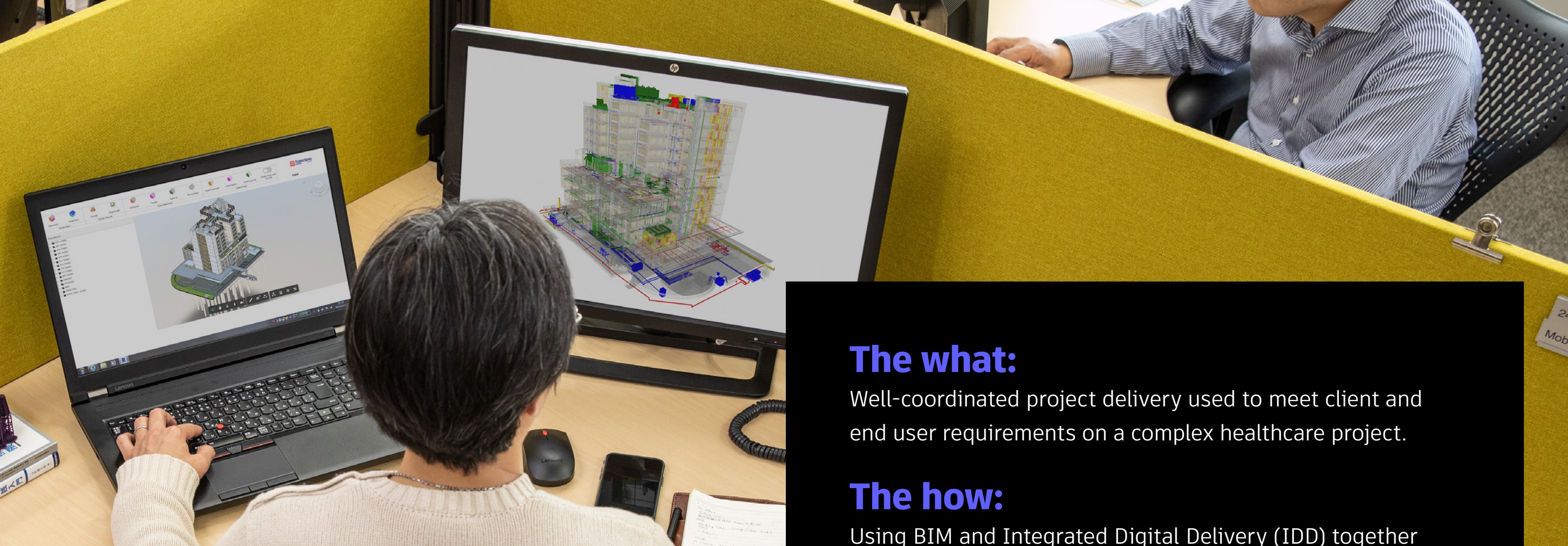
Adopting BIM workflows:

Transition from 2D CAD to BIM tools.

Implementing design collaboration tools across teams:

Connect BIM data to the cloud.





Tiong Seng Contractors:

Integrated digital delivery using BIM and cloud collaboration

The what:

Well-coordinated project delivery used to meet client and end user requirements on a complex healthcare project.

The how:

Using BIM and Integrated Digital Delivery (IDD) together brought a new level of coordination for the team, including shorter review cycles and more visibility.

The why:

Using BIM and IDD achieved 25% reduction in construction time while meeting high-quality construction expectations.

“With Autodesk AEC Collection and BIM 360 solutions, the collaboration between project stakeholders is seamless. We saw a **33% improvement** in resolving coordination issues as compared to past projects where BIM 360 was not adopted.”

Ye Zaw Lin, Corporate BIM Manager, Tiong Seng Contractors PTE LTD



Move from 2D CAD to 3D BIM workflows

Manual and complicated 2D CAD processes are prone to errors, omissions, and oversights during planning and preconstruction. The result? Budget and schedule overruns.

As the general contractor, you need to take 3D designs provided by architects and engineers and make them constructible, while coordinating all the data from the other specialty trade contractors on the project.

This is a nearly impossible task with 2D sheets. Designs are outdated by the time you send back your markups and there is a higher chance for data loss or errors when project documents are passed back and forth.



65%

of global building projects currently utilize BIM technology, requiring general contractors to evolve to stay competitive.

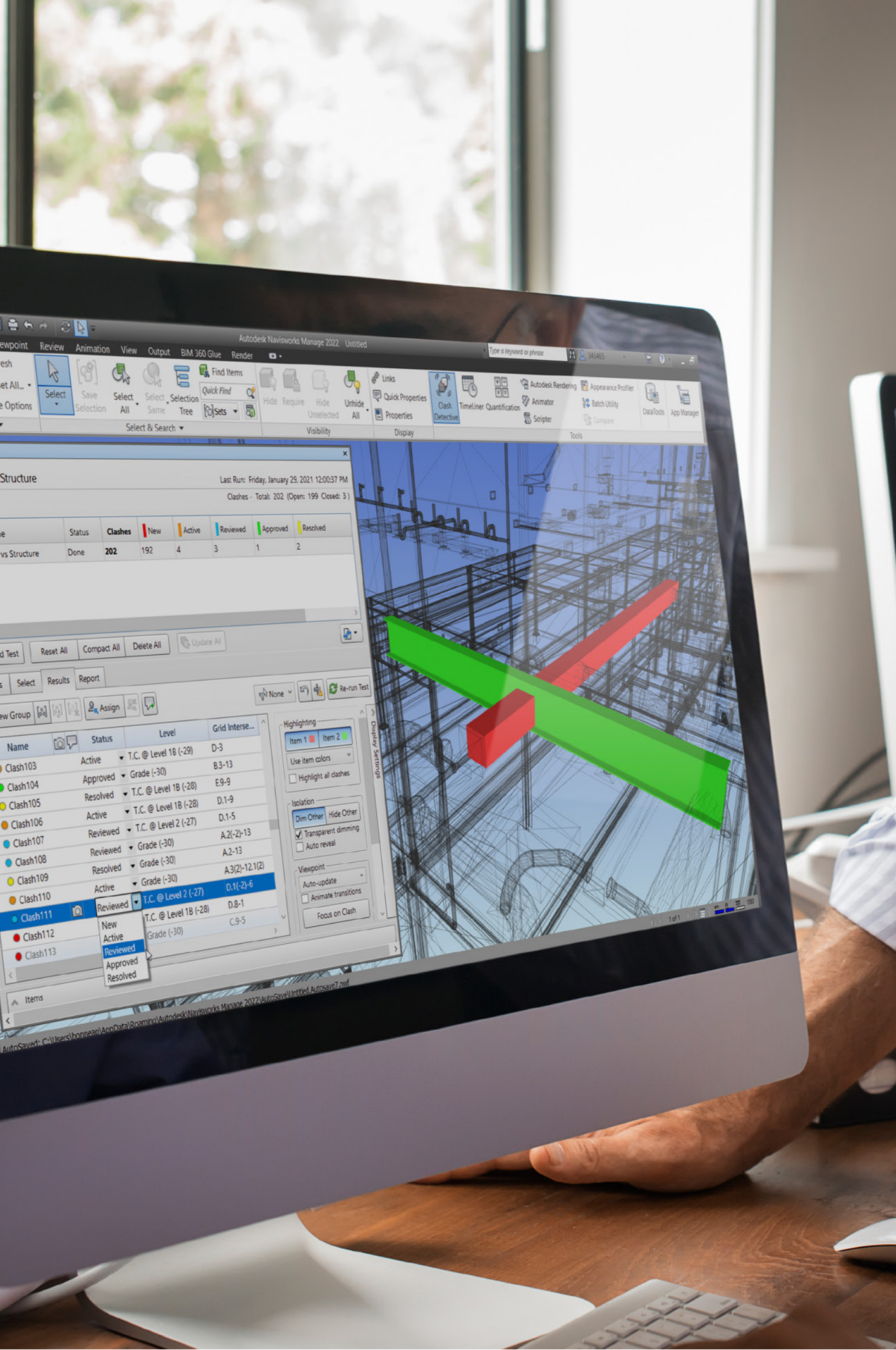
Source: GlobalData

The Solution: **Business outcomes of adopting BIM workflows**

Give your projects more predictability when you move from 2D to BIM technology for 3D modeling, coordination, and material quantification.

Achieve clear, measurable business outcomes by adopting BIM workflows for virtual design and construction:

- + Save time and money that comes with costly rework by solving problems using a 3D digital model
- + Reduce constructability issues on site with better project coordination and clash detection
- + Gain cost assurance to improve forecast accuracy of project margins
- + Optimize schedule durations for project efficiencies and returned savings
- + Increase project win rate with more accurate and efficient bids



“On a recent project, a design element posing a significant conflict got all the way to the clash detection phase before it was discovered. Identifying the error before construction ultimately saved more than **\$200,000** in potential rework.”

Monica Emmons, BIM Manager, Fortis

How can Autodesk help?

Autodesk's platform of industry-leading BIM and CAD software supports team integration from design to construction, unlocking new capabilities.

Learn more about Autodesk's
AEC Collection for Construction

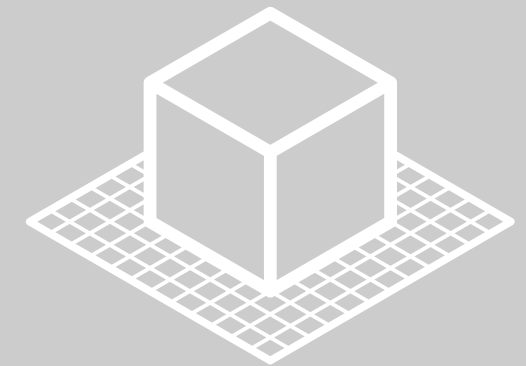


Construction model authoring:

Add constructability data to a 3D BIM model including cost, schedule, logistics, and other information that makes a model ready for the field.

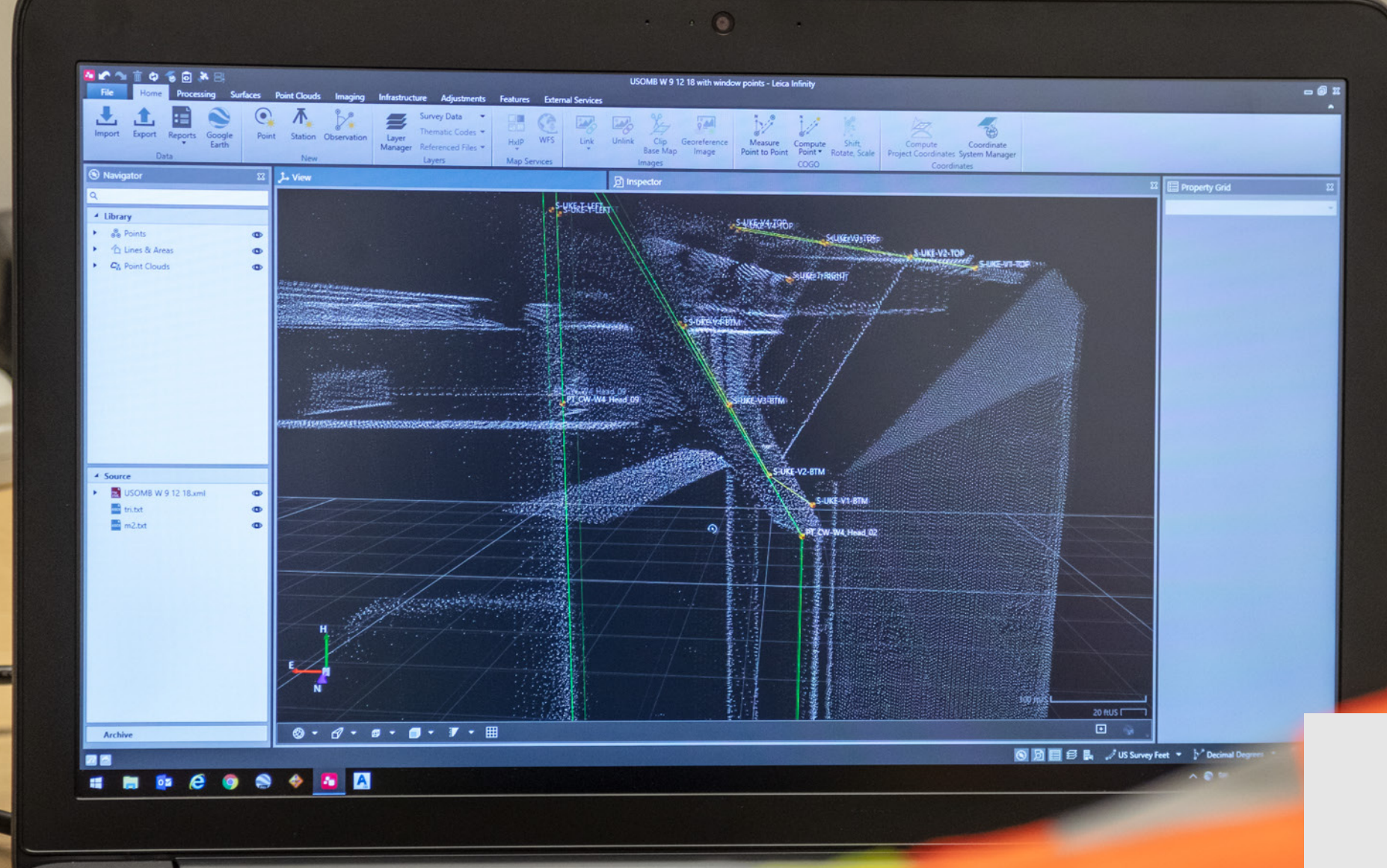
Coordination and clash detection:

Aggregate multi-disciplinary models into a single 3D view to identify errors and clashes early on.



Material quantification:

Virtually markup 3D geometry and perform accurate calculations to save time and avoid costly mistakes.



Connect your BIM workflows in the cloud

Once you make the transition to BIM and all project stakeholders are working with the same file format, it's time to address two key needs during the early design and planning phases: efficiency and collaboration.

Efficiency:

Cloud connected workflows remove silos, enable automation, and significantly reduce design and collaboration time.

Collaboration:

With better access and transparency to design phase activities, you can easily manage project partners like designers and specialty contractors.



*“The Covid-19 pandemic has sped up the pace of digital transformation by seven years – with companies acting to implement these changes **20-25 times faster than expected.**”*

Source: **McKinsey & Co**



The Solution: **Business outcomes of adopting cloud-based design workflows**

Adopt cloud-based BIM collaboration solutions to connect teams, tools, and project data. With everything in the cloud, you see reduced fragmentation and improved project outcomes.

Cloud collaboration enables you to achieve the following business outcomes:

- + Reduce overall design time and get to construction faster with more efficient and automated workflows
- + Achieve better stakeholder engagement for increased client satisfaction
- + Improve the handover experience with better document management for post-occupancy

Mace automated the process of aggregating the design team's Revit BIM models, reducing the time spent each week on model management from **440 minutes to just 10** – a 98% improvement in design time.

More info: [**Facebook Data Center project**](#)



How can Autodesk help?

Autodesk's cloud-based BIM collaboration tools unlock new capabilities for virtual design and construction teams:

Learn more about Autodesk cloud-based design solutions, including **Autodesk Docs** and **Autodesk BIM Collaborate / BIM Collaborate Pro**



Design collaboration and co-authoring:

Connect people, workflows, and insights in the cloud; co-author BIM files in real-time, use project data to make informed decisions, and get teams on the same page.



Document management:

Store and manage all project data in a common data environment to ensure smooth stakeholder handover and connect workflows throughout all phases of a project.



Visualization and simulation:

Create visualizations that show stakeholders what buildings will look like before construction starts. They also help to detect and address costly issues ahead of construction.



Dura Vermeer:

Reduce time to construction with
BIM and design collaboration

The what:

Fully integrate digital construction technology starting from the design phase for better transparency and improved stakeholder collaboration.

The how:

Implementation of Autodesk BIM Collaborate Pro* to effectively manage the collaboration with subcontractors during all project stages.

The why:

Decreased time to construction by 25 percent average per project—achieving construction readiness.

*Formerly BIM 360 Design

“[With Autodesk BIM Collaborate Pro*] we significantly reduced a large number of project changes, increased the speed of a construction-ready design and completely eliminated the IT efforts for project initiation.”

Sander de Zee, BIM Manager, Dura Vermeer



*Formerly BIM 360 Design

Deliver high-quality projects with better outcomes

General contractors hold all the risk in meeting project deadlines and delivering high-quality building projects with minimal issues. That's why you need better project insights to manage each phase more effectively and to streamline the handover from office to field.

With BIM workflows and cloud-based collaboration, you ensure projects will be completed with more control over schedules and costs, and will require less rework in the field.



Take the next step in your digital transformation

Autodesk's platform of tools and coordinated workflows offers valuable opportunities for data flow across disciplines.

By starting your transition to the cloud during the early phases of design and planning, you and your teams are better equipped to control project risks during construction.



- + Autodesk is a trusted partner in design and leads to a stronger ecosystem of end-to-end solutions to help you win in construction
- + Pair Autodesk's BIM and CAD tools - such as Revit, AutoCAD, and Navisworks - with the Autodesk Construction Cloud to seamlessly connect your data through all phases of construction



“The team fully embraced digital delivery and we’ve seen huge benefits. One of the most notable things is the quality we’ve handed over to the client at the end of the job. We’ve had less rework on site, we had a smoother transition throughout the different phases – from design through delivery and handover.”

Ger Hayes, Project Director, John Sisk & Son

