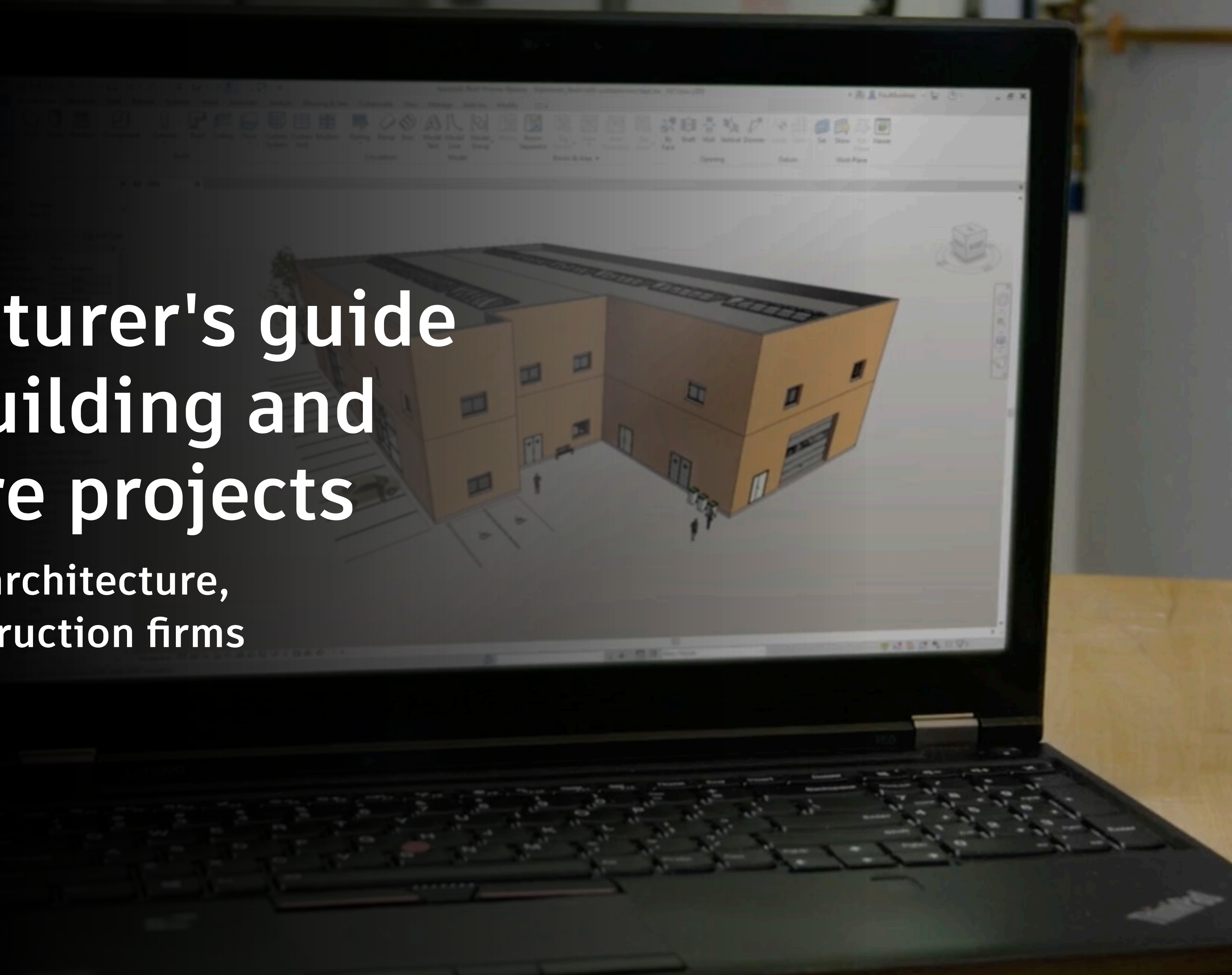




# The manufacturer's guide to BIM for building and infrastructure projects

Why BIM isn't just for architecture, engineering, and construction firms



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# Introduction

Building Information Modeling (BIM) is a nearly universal method for planning, designing, constructing, and managing buildings and infrastructure projects. And for good reason. It takes an army of architects and engineers to complete a project, and BIM ties everyone together around a universal, always up-to-date model—which paves the way for more efficient workflows.

Manufacturers have traditionally been disconnected from these workflows—largely working in different data formats, with different sources of information, at different paces. The evolution of building and infrastructure projects from 2D and asynchronous to 3D and highly collaborative has opened the door for manufacturers to bridge this gap. In fact, there's more room than ever for wider integration and collaboration across disciplines.

BIM enables manufacturers to participate in building and infrastructure projects in more meaningful ways and create more impactful contributions. And your clients have picked up on this. More and more architecture, engineering, and construction firms expect their suppliers to join the BIM ecosystem.

But the path forward isn't always clear.

## In this guide, we'll explain:



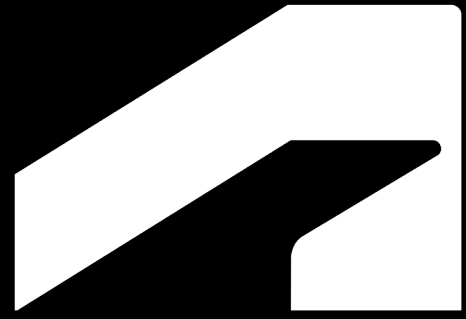
The value of collaborating with your clients in the BIM ecosystem



How building product and industrial equipment manufacturers can use BIM



How to create, exchange, and consume BIM data



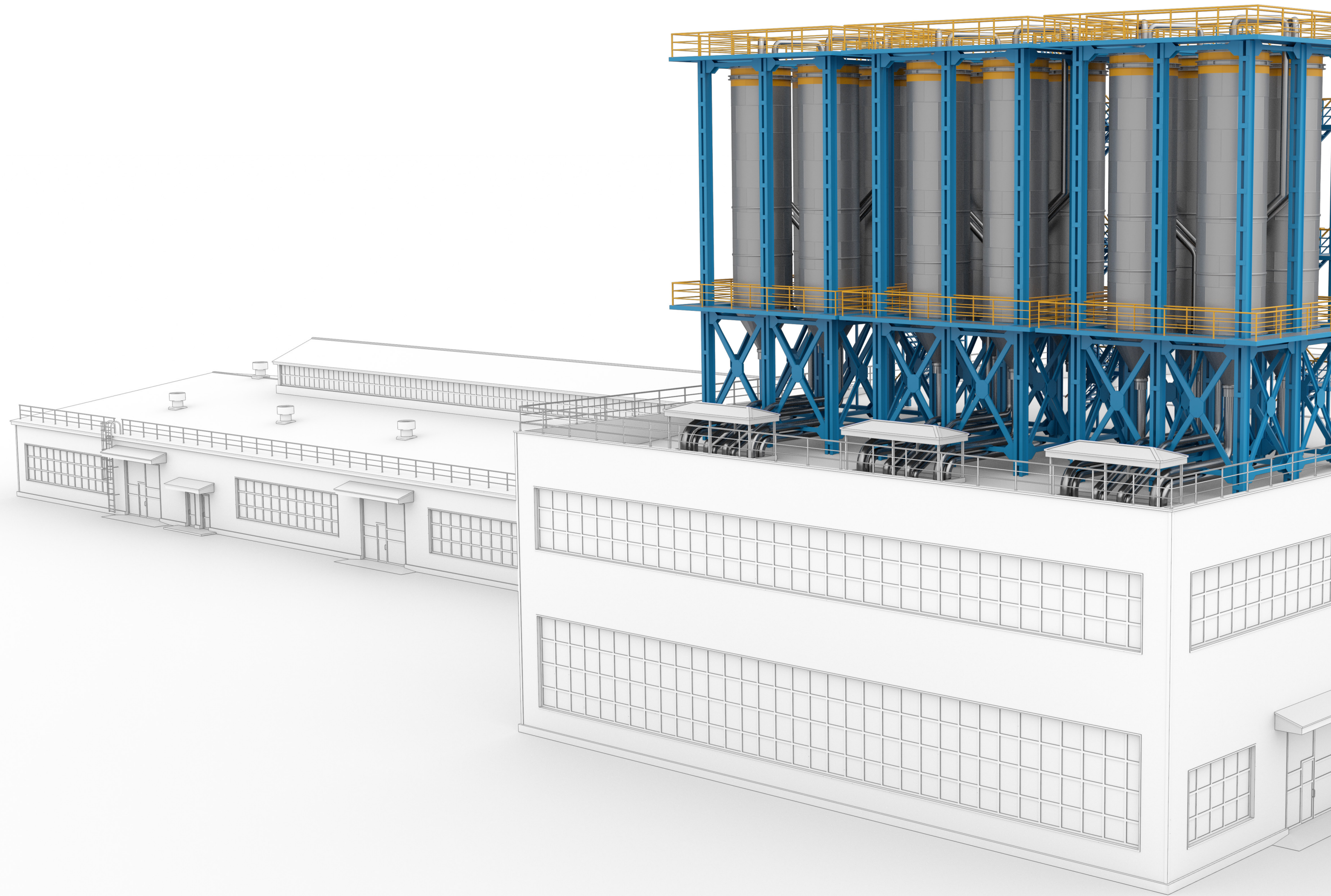
**74%** of the architectural design community has adopted Building Information Modeling.

NBS, 2018

# What is BIM?

BIM (Building Information Modeling) is a process that uses 3D models to plan, design, build, and operate building and infrastructure projects. It's defined by the U.S. National Building Information Model Standard Project Committee as “a digital representation of physical and functional characteristics of a facility” or “a shared knowledge resource for information about a facility forming a reliable basis for decisions during its lifecycle; defined as existing from earliest conception to demolition.”

BIM makes it easier for all stakeholders—from mechanical designers to architects to structural engineers to building owners—to share information about a project, acting as a common “language” between these specialized disciplines. And at the end of the project, BIM delivers a reliable, cohesive digital model for effective operation and maintenance management.



# Why manufacturers need BIM

In a world without BIM, data is passed along in phone calls, emails, and shared drives, in different formats, incongruous with and disconnected from other sources. This way of working makes client collaboration challenging, decreases efficiency, and often results in added costs.

But with BIM, manufacturers set themselves up for success across the entire product lifecycle. They are more likely to win bids, meet timelines and budgets, and can even generate additional revenue streams after project completion with ongoing services and maintenance around their digital models.

## Win business

Providing BIM objects—simplified digital representation of manufactured building products—makes it easier for your clients to specify your products, increasing your likelihood of winning their business.

## Improve efficiency

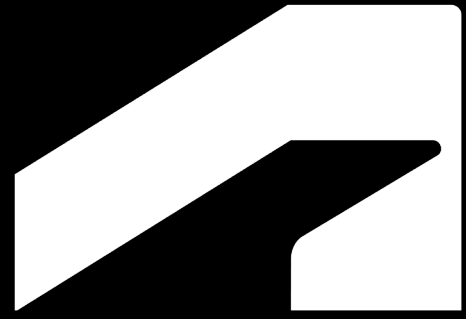
For complex projects where manufactured and constructed elements are tightly interwoven, BIM provides a more integrated workflow around one centralized data source. This means all project stakeholders can seamlessly coordinate development processes, minimize risk, and keep the project on time and on budget.

## Deliver better solutions

For bespoke manufacturers and fabricators, when you use BIM models from your clients you can design within the context of the facility—which empowers you to make better decisions and encounter fewer issues down the line.

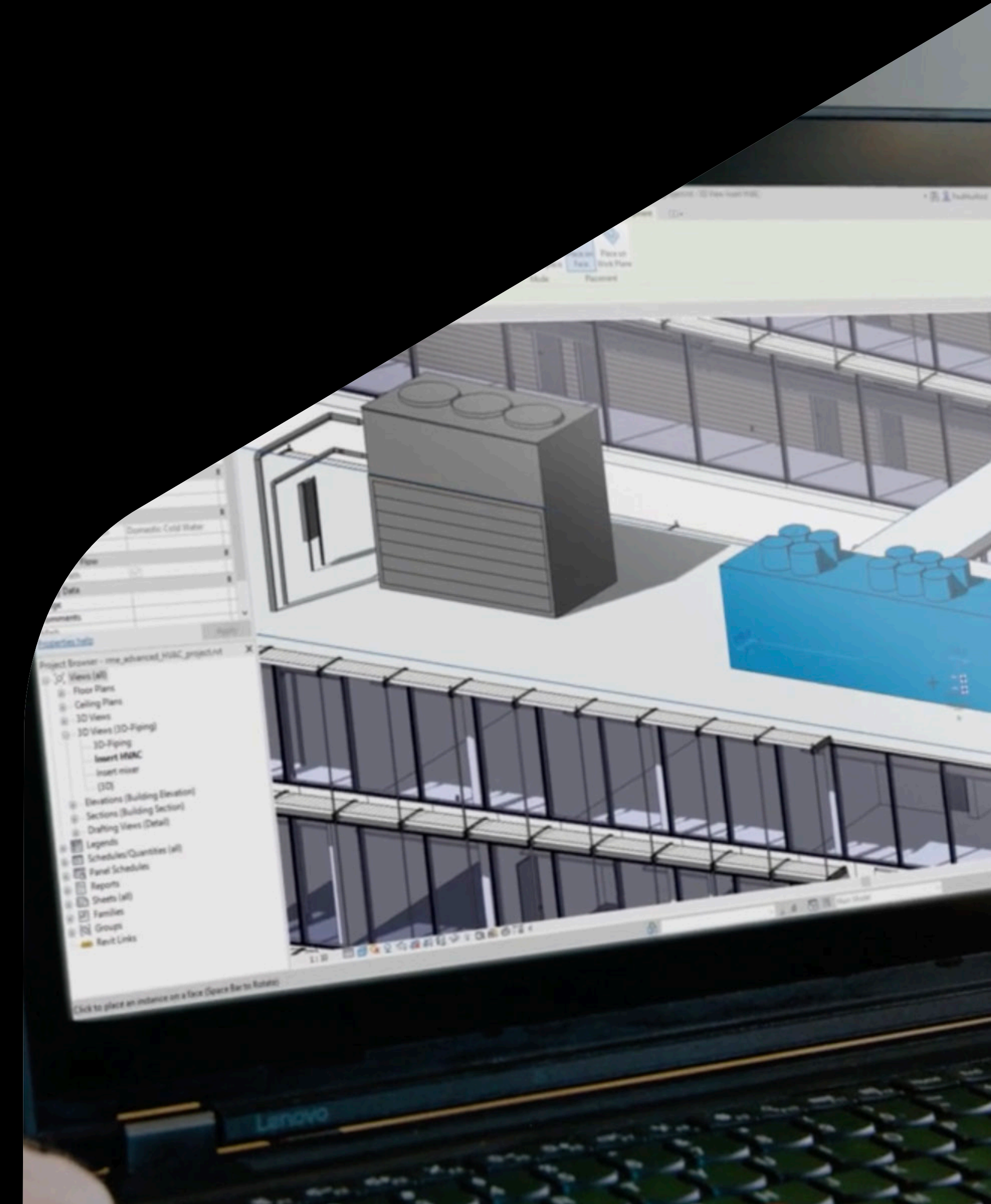
## Meet client expectations

BIM is widely adopted by architecture, engineering, and construction firms. Europe even has BIM mandates for building projects. This means that BIM is only becoming less optional for the manufacturers that operate in this world and is quickly becoming the expectation of clients and collaborators.



In the water projects sector, where BIM adoption is high, project teams see BIM as **the foundation for successful outcomes**. As the top project benefits gained from adopting BIM, respondents chose better design solutions (68%), reduced errors (57%), and increased ability to maintain quality (42%).

The Business Value of BIM for Water Projects, SmartMarket

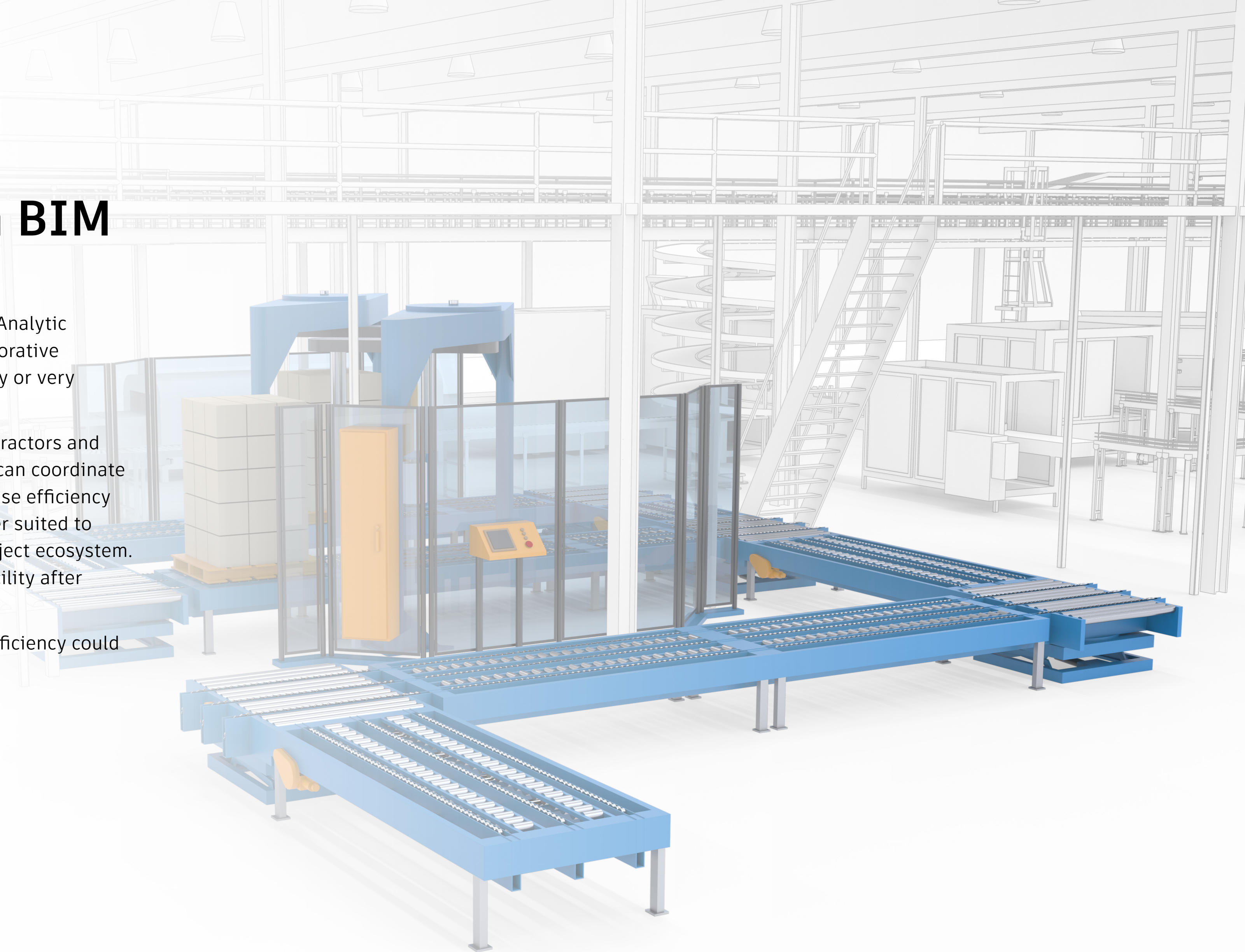


# How collaborating with BIM helps your clients

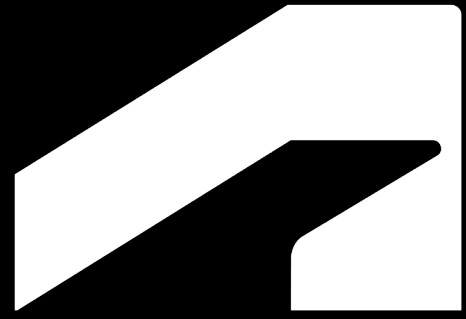
In a 2020 survey conducted by the Harvard Business Review Analytic Services, 73% of AEC respondents said having a highly collaborative relationship with building product manufacturers is extremely or very important to the success of their projects today.

When manufacturers can “plug into” the BIM ecosystem, contractors and building owners gain value across the project lifecycle. They can coordinate the project more effectively, avoiding costly errors and increase efficiency overall. They can enjoy manufactured elements that are better suited to their requirements due to the tighter integration into the project ecosystem. And they can use their holistic BIM models to manage the facility after project completion.

It's not surprising that 48% of architects said lack of BIM proficiency could be a deal breaker in choosing a manufacturing partner.







**Nearly three-quarters of architects surveyed said that highly collaborative relationships are very important to the success of their projects.**

The Future of Building Design, Harvard Business Review Analytic Services (2020)

# BIM use cases

Intelligent models are used very differently during the design and construction phases of a large commercial or industrial project. Architects often start with a generic model that is typically pulled from an internal BIM content library. This model is optimized for the design process with the appropriate parameters, properties, and scheduling. In other words, the model has just enough level of detail—LOD—to support the design and bidding phase.

When the bid is won and construction starts, actual products are selected. At this point, the generic intelligent model is replaced with a manufacturer-specific intelligent model. In general, the construction-phase model provides more-accurate information for collision detection, coordination among trades, installation, and maintenance.

What types of product models can be recreated in intelligent model-based solutions, and how? The answer depends on the type and purpose of the product.

To deliver intelligent models with an appropriate level of detail (LOD) suitable for construction, manufacturers can start by simplifying a full 3D CAD model. They would strip the detail that would not be relevant to the AEC firm, and then export a BIM-based intelligent version of the original model from this much smaller file.

## Building products

If your manufacturing business creates products that go into buildings, creating BIM content helps AEC clients choose and specify your products as they design. Some best practices include:

- If your product does not have variants, create the intelligent model natively in Revit.
- If you're offering a catalog product with predetermined variants, create a Revit Type Catalog that lets clients specify the configuration they need.
- If you're offering configured-to-order or engineered-to-order products, export BIM content from the MCAD (mechanical computer-aided design) models.

## Custom fabrication

If your business offers custom fabrication, then you'll likely need to design your product around BIM data. Given the large scale of many BIM projects, to create your design you'll need to selectively reference in only necessary information.

## Industrial projects

If your business supplies industrial systems that go into plants, factories, or infrastructure projects, the best practice is to export BIM projects. Since industrial systems are made up of many components, it's best to export your engineered solution into your clients' BIM projects, using as many BIM elements as necessary.

# Conclusion

To grow business, manufacturers must become more than just suppliers. They can be partners, collaborating with clients and project stakeholders across disciplines to solve problems, speed up timelines, and stay on budget. BIM not only enables this collaboration, it eliminates the barriers to project give and take, elevating manufacturers to the level of trusted partners.

You have much more to offer than just data. Your expertise in your solutions is priceless, and now, the digitalization of building and infrastructure projects has given you new routes for bringing your unique insights to the table.

BIM isn't just another project requirement. It's your gateway to tighter integration—and a more elevated role—in the world of your clients.



# How one industrial tech firm is winning customers with a new BIM execution plan

ABB Electrification is digitalizing its entire product portfolio, making it easier for customers to integrate its products directly into their BIM models. They created a catalog containing all of the company's products and their data sheets. This database has streamlined the workflows of architects and designers working in BIM models, as they now have access to a single source for all ABB products and their corresponding product data.

“With BIM, our products are no longer simply objects; they are carriers of valuable information,” Emanuele Tosatti—global channel manager at ABB Smart Building says. From a product's weight to the heat it emits, architects are able to find all the data they'd ever need by simply accessing ABB's cloud-based BIM catalog. This process won't just save architects and designers huge amounts of time and money; it will also reduce design errors, as the data is available from the outset and the need for painstaking manual collection and calculation is eliminated, ultimately improving the end result.

For ABB, this has translated to increased sales by keeping the company competitive—BIM is, after all, becoming mandatory in an increasing number of countries. A multinational company such as ABB must develop new BIM solutions if it wants to avoid being left behind.

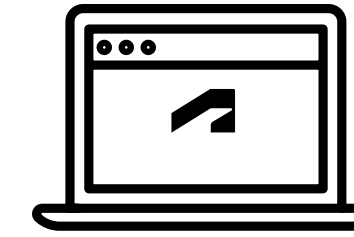
“We regard BIM as a key factor for improving the efficiency and future-proofing the work of global partners working in the fields of architecture, design, and construction,” says Adalbert Neumann, head of global marketing and sales at ABB Smart Buildings and chairman of Busch-Jaeger, a manufacturer of electrical installation technology and part of the ABB Group. Neumann emphasizes that BIM is a great example of how digitalization can make the entire value chain more efficient.

Image courtesy of ABB

# Getting started

As a global leader in the integration of architecture, engineering, construction, product design, and manufacturing processes, Autodesk can help you develop the capabilities needed to achieve your goals.

Visit our solution center to learn more about how you can begin collaborating in the BIM ecosystem.



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