



Integrated teams. Boundless possibilities.

**To thrive in a changing market,
firms are making the move
from CAD to BIM and embracing
integrated engineering.**





Tighter timelines. More complex projects. Succeeding in this economy isn't about working harder. It's about working together.

See how engineering firms are embracing BIM, and building upon that foundation to adopt integrated engineering workflows that improve their bottom line and push them one step ahead of the competition.

Read on to discover how.

Shrinking timelines. Rising expectations.

**The market is changing fast.
Ready to change with it?**

The demands of today's evolving environment require critical shifts in how work is done. Today's clients are increasingly demanding:



more complex buildings
and structures



delivered faster



higher quality designs



using more sustainable
methods and resources

All of this is happening in an increasingly competitive landscape where firms view one another to recruit top talent and operate with razor-thin margins for error.

To stand out from the pack, engineering firms are leaning into digital engineering capabilities.

The first step is making the move from CAD-based processes to working in a BIM environment.



BIM-first practices are fast becoming the new normal.

Research points to the rise of integrated engineering firms.

According to a June 2020 IDC report, the COVID-19 pandemic has sped up the pace of digital transformation by 5 years, creating urgency around BIM policies and standards (ie ISO 19650).

While architecture firms are the most likely to have BIM practices that have evolved over many years, engineering and construction firms are embracing BIM at record levels.

75%

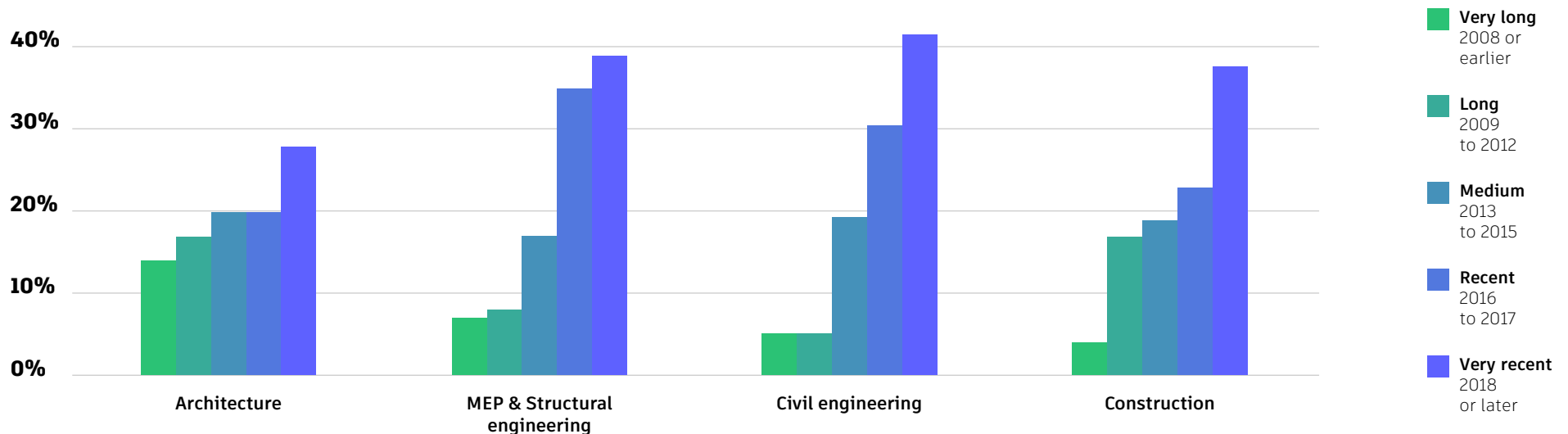
countries representing global GDP either have BIM initiatives in place or are in the process of implementing them.¹

51%

of MEP and structural engineers currently use BIM on at least half of projects, with a total of 80% forecasted by 2024.²

Accelerating Digital Transformation Through BIM, SmartMarket, 2021

BIM adoption curve



Success in today's market starts with the move from CAD to BIM.

Integrated engineering firms are reducing rework and shrinking design time.

Building Information Modeling (BIM) is the foundation of digital transformation in the AEC industry. For engineers, making the move from CAD to BIM is core to success in this competitive environment.

Why? Because manual, disconnected production workflows are prone to errors and omissions, leading to major budget, schedule and cost overruns.

“Sharing models reduces rework, which gives teams more time to design, and can also eliminate a lot of the human error that occurs when drawings are interpreted.” Erleen Hatfield, PE, AIA, LEED AP
Founder, Hatfield Group

In an integrated BIM environment, multiple design disciplines work closely to better coordinate their work. By linking their models together, teams can better visualize and identify clashes to coordinate.

This allows you to:



Save time and money that comes with costly rework by identifying errors earlier on in a BIM environment



Reduce risk and constructability issues down the line with better coordination & clash detection



Deliver better design, faster with shared data

The benefits are real. According to the NBS National BIM Report³:

86%

of projects with BIM reported cost savings from labor, collaboration, and/or materials.

71%

of BIM users report that BIM has made them more productive, and just over half have experienced increased profitability.

BIM: A competitive differentiator

“BIM lets us punch above our weight. It absolutely allows us to compete on any type of project, from small things all the way up to mega projects, to airports and stadiums and beyond.”

Erleen Hatfield, PE, AIA, LEED AP
Founder, Hatfield Group

“BIM does so much more for us than help address clashes. We’re optimizing the use of prefabrication, accelerating projects, and finding efficiencies that benefit whole projects—thanks to BIM.”

Brian Thomas,
Director, Kirlin Group



Integrated everything.

With everyone on the same page, firms are tapping into new levels of innovation.

Today's successful firms are taking advantage of more integrated engineering processes, enabled by data-rich models, and benefiting from better collaboration, and communication across the entire project life cycle.

Autodesk® Revit® models also provide a launching point for more integrated analysis and calculations, designing for constructability, and design automation.

Integrated engineering workflows are making new levels of innovation and problem-solving possible, and projects more profitable.



Build on BIM to achieve more

Here are four ways engineering firms are benefiting from integrated engineering.

01

Seamless Collaboration

→ Deliver better projects faster

02

Design Optioneering

→ Optimize designs & win more work

03

Integrated Analysis

→ More efficient processes & reduced risk

04

Design Automation

→ Accelerate productivity & retain top talent



01

Seamless Collaboration

The Benefit:

Streamlined project delivery

Once you make the transition to BIM and all project stakeholders are working in a coordinated BIM environment, **teams can connect their Revit models through the cloud** using Autodesk BIM Collaborate Pro. This gives all stakeholders visibility and access to accurate information whenever they need it—always synchronized, always up to date.

This allows engineers and architects to stay on the same page throughout the design process, find better solutions to design challenges, and deliver projects faster.

Teams can now anticipate and mitigate the potential impact of changes earlier on and model sharing with fabricators and contractors ensures a more seamless handoff for construction.

In short, effective collaboration is key to success.

According to the NBS National BIM Report⁴:

87%

agreed that firms that can effectively collaborate will be the most successful.

01

Seamless Collaboration

The Benefit:

Streamlined project delivery

“We used to have 30 site issues a week, and up to 300 things to fix at the end of the project. Recently, we had about 30 site issues on the entire project. That’s a huge reduction in the amount of work we have to do to fix problems.”

Dominick Paradis,
Design Engineer, Canam

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*“With robust, cloud-based BIM, everyone could see behind the curtain and understand what everyone else was doing. The construction manager could better understand why the architects did what they did, the architects understood exactly what the MEP engineers were contributing, and so on. **Everyone was on the same page, and there were no surprises.**”*

Paul McGilly,
Associate Principal | Digital Design,
Buro Happold



| 02

Design Optioneering

The Benefit:

Optimized designs

Design optioneering involves using the latest engineering tools to rapidly explore design options to find the best engineering solution. Whether using scripts that integrate your calculation spreadsheets with CAD or using computational design that integrates your analysis tools with BIM, there are better ways to find the best design options for your clients.

By eliminating repetitive tasks and rework, engineers can fast-track load analysis and system design strategies to reach optimized design solutions faster.

This delivers designs that are more constructible to build and sustainable to operate.

Once your team can achieve this on every project, you'll be able to accelerate the design phase, **exceed client expectations and ultimately win more work.**

02

Design Optioneering

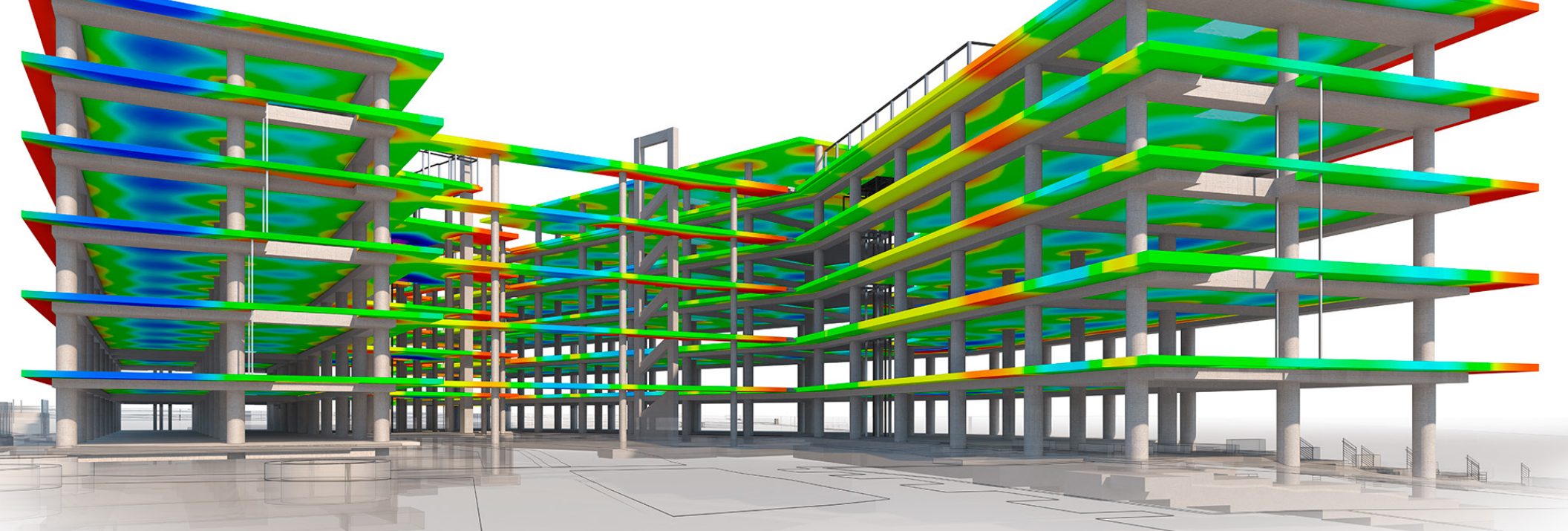
The Benefit:
Optimized designs

“We’re not just looking at one answer and then taking that forward, we are actually trying to optimize our design early on. Instead of just providing a solution, now we try to provide an optimal solution.”

Nidhi Sekhar,
Senior Computational Designer, LERA

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| 03

Integrated Analysis

The Benefit:

More efficient processes

With new features and functionality, Revit can now perform accurate MEP analysis calculations that are integrated with industry leading analysis tools, like EnergyPlus.

Structural engineers can centralize their decision making in Revit through its integration with Robot Structural Analysis, custom spreadsheets and other 3rd party analysis tools.

Engineering teams no longer need to manually manage design information in multiple applications or create separate

analytical models that need to be built and updated in parallel as designs change.

By integrating engineering workflows into your Revit model, with all engineering data calculated and stored in one centralized, data-rich model, the process is far more efficient, **cutting out redundant work, avoiding errors and automating downstream detailing.**

03

Integrated Analysis

The Benefit:

More efficient processes

“Using Revit, we can do better calculations. Having that interactive data solidified early on with the Revit model, means clients wouldn’t have changes down the road.”

Bimal Patwari,
Founder & CEO, Pinnacle Infotech

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04

Design Automation

The Benefit:

Accelerated productivity

Automated modeling and documentation is better than ever with Revit. Using standardized BIM content increases the quality and speed of modeling. Drawing creation and annotating can also be sped up using discipline specific Revit project templates and libraries.

Hours of tedious work spent on documentation, code checking, and interoperability can be reduced to minutes.

Automation also allows contractors to automate estimating, detailing, and fabrication tasks leveraging the engineer's design model.

By leveraging these design automation tools, engineers can eliminate repetitive, time-consuming tasks to work smarter and accelerate their productivity. **The result is more time spent on engaging, high-value work.**

04

Design Automation

The Benefit:

Accelerated productivity

"That task that was taking five hours, all of a sudden it takes a few seconds."

Alfonso Oliva,
Director, LERA

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"Everything now is more real-time, everything's a lot quicker when we need responses to pricing, to design changes. I think that's huge."

Ken Luong
Project Manager, TDIndustries



Wherever you are in your BIM journey, Autodesk can help you take the next step

Whether you are just beginning your move to BIM or expanding the possibilities of integrated engineering workflows, Autodesk can help you put BIM to work for your firm.

We're helping MEP and structural engineering firms like yours to streamline the way they work and achieve solutions that lead to shorter time frames and more profitable projects.

Ready to get started? Talk to one of our product sales experts today to see how you can start making the most of BIM and integrated engineering.

GET IN TOUCH >

1. [The Next Normal In Construction](#), McKinsey & Company, 2020
2. [Accelerating Digital Transformation Through BIM](#), SmartMarket, 2021
3. [NBS National BIM Report, 2019](#)
4. [NBS National BIM Report, 2019](#)