



# Staying competitive

CAN ARCHITECTURE FIRMS SURVIVE WITHOUT BIM?





## OVERVIEW

It's a 3D world after all

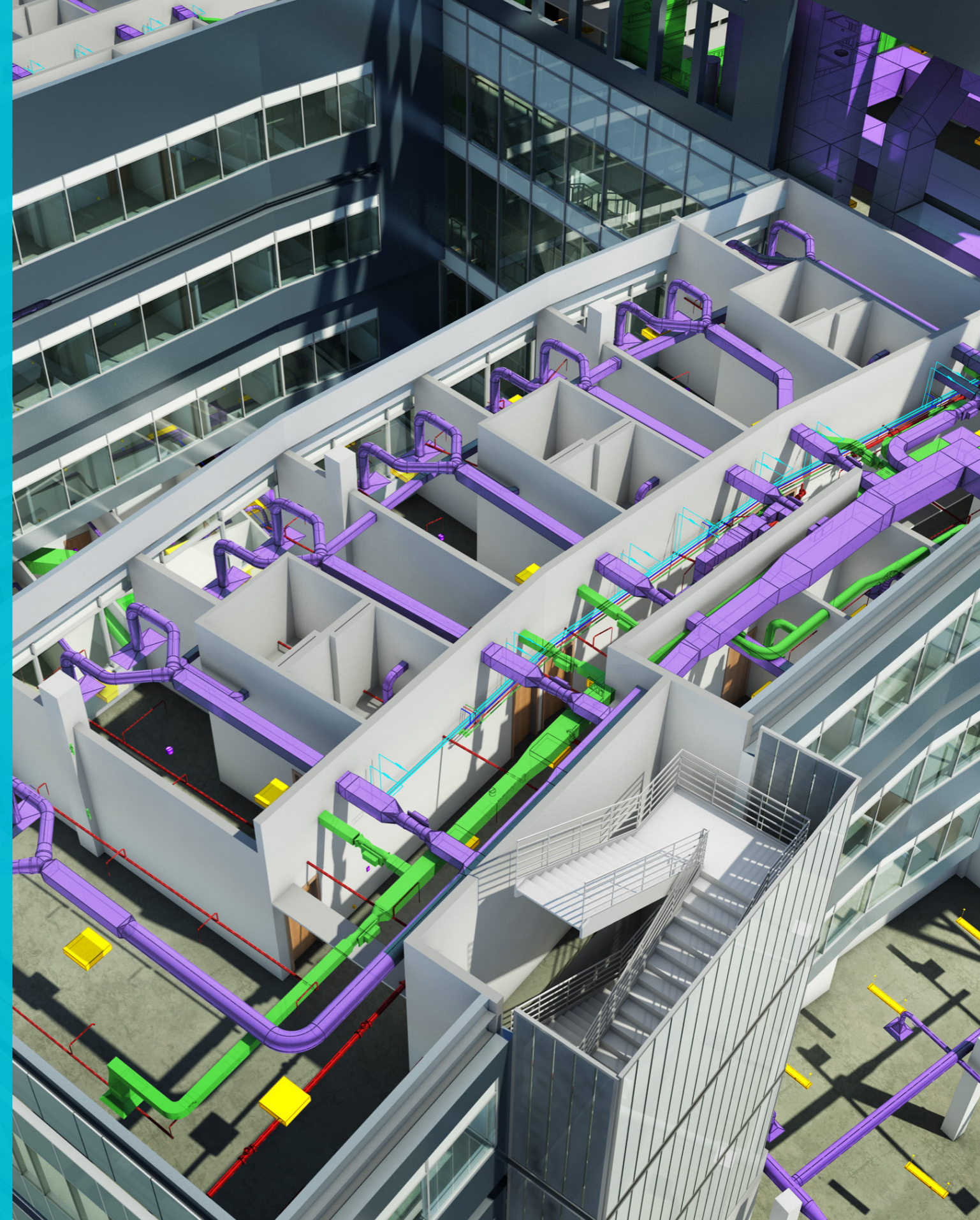
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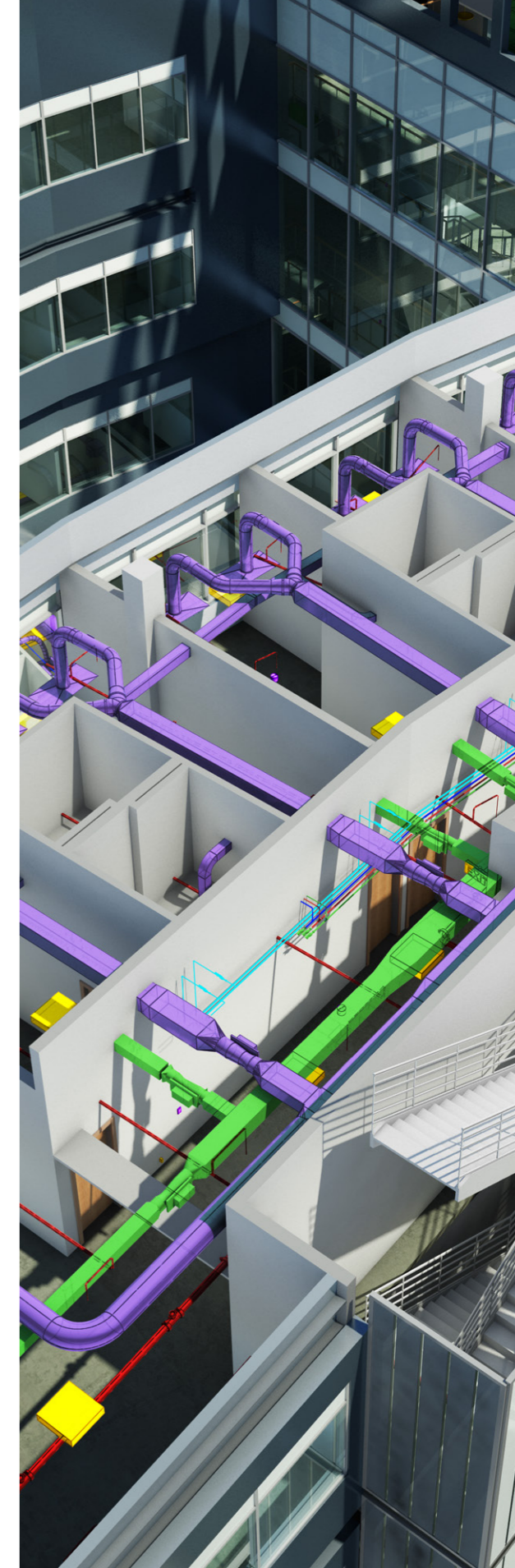


# It's a 3D world after all

At the turn of the 21st century, the building and construction industry was undergoing a transition from the 2D method for design and construction it had used for centuries to a new approach using 3D digital models: Building Information Modeling (BIM).

BIM involves creating and using intelligent 3D models to develop and communicate project decisions. Akin to the decades-long use of digital prototypes by the manufacturing industry for the engineering, analysis, and production of product assemblies, the building industry began adopting a similar approach for their projects.

While BIM was gaining traction within the industry, the global economic recession was wreaking havoc – leading to significant declines in production and profit margins. Today, economies are rebounding and construction spending is increasing, but the fallout from the recession lingers. Competition is greater than ever and all the players in the building supply chain, from architects and engineers to general contractors and fabricators, are under pressure to deliver their projects faster and on budget.

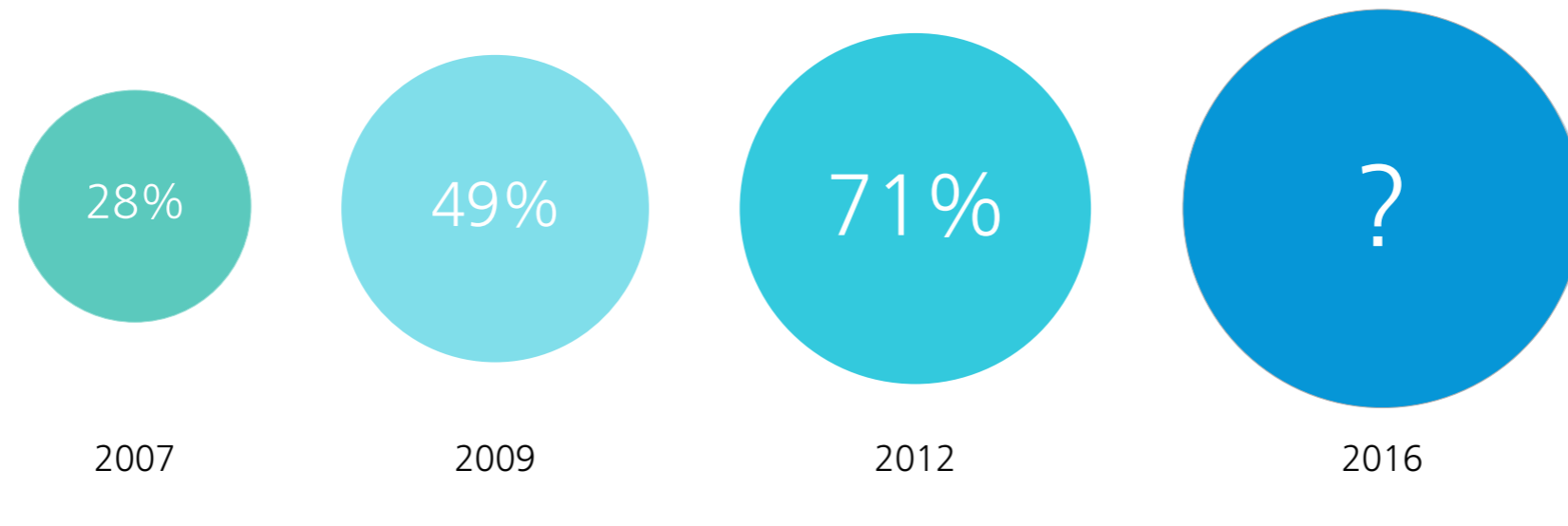




# Industry trends: Rapid adoption of BIM in architecture

In this landscape, **more and more architecture firms are turning to BIM** to help give them a competitive advantage and improve productivity. Numerous studies and surveys document the rapid adoption of BIM across the building industry and around the world.

## Levels of BIM Adoption in North America



Source: 2012 SmartMarket Report "The Business Value of BIM in North America"



# BIM mandates growing

As adoption of BIM increases, the use of digital models for virtual design, construction, and collaboration is becoming standard, and governments, organizations, and owners around the world are mandating BIM on new building projects. For example:

- In early 2014, the European Parliament approved a **Directive for Public Sector Procurement** that encourages public authorities to consider using BIM in public works and draws attention to the opportunity and benefits that BIM presents to public construction projects.
- As of 2016, the **UK government requires collaborative 3D BIM on all government projects**. Since the government accounts for approximately 40 percent of UK construction capital expenditures, this is an aggressive BIM mandate.





> In the United States, the General Services Administration (GSA), the government agency that builds and manages federal facilities and, as such, the largest owner of commercial space in the United States, has been requiring the delivery of building information models for major federal building projects since 2006.

> Since 2008, the U.S. Army Corps of Engineers has required the use of BIM for all military construction projects to improve construction time and costs.



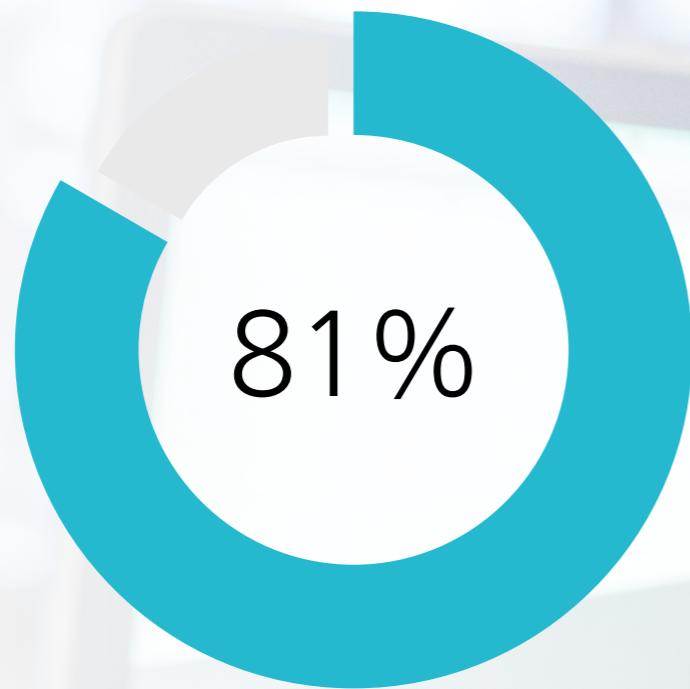


# BIM and new strategies for architecture

BIM supports important new strategies for building design that are changing the context, businesses, and practices of firms in the AEC industry:

- There is a growing expectation of closer collaboration among architecture, engineering, and construction disciplines. **Model-based workflows and BIM software are key enablers of integrated teams.** Also, advancements in technology for collaboration and communication, and the prevalence of social, mobile, and **cloud technologies** is transforming how people can work together.
  - The use of prefabrication to improve construction productivity is increasing, with McGraw-Hill Construction estimating that as of 2013, more than 90 percent of projects in North America used some aspect of **model-driven prefabrication and modular construction.**
- The precision and intelligence of continuous BIM workflows provides a bridge between design intent and construction, connecting designers with fabricators and contractors.
- **Sustainability** has become the expected standard for any significant building project today. Model-based BIM workflows and analysis tools help firms evaluate sustainable design approaches and deliver greener buildings more cost-effectively.





**Percentage of U.S. companies that indicate they consider BIM capabilities when making their selection for project teams.**

These BIM adoption rates, owner mandates, and industry trends clearly highlight that the building and construction industry is moving away from traditional ways of doing business and embracing new methods and technologies for building delivery. Which begs the question: can a firm still relying on decade's old 2D processes and technologies survive? But before we tackle that question, let's take a closer look at BIM.

Source: 2012 SmartMarket Report "The Business Value of BIM in North America"



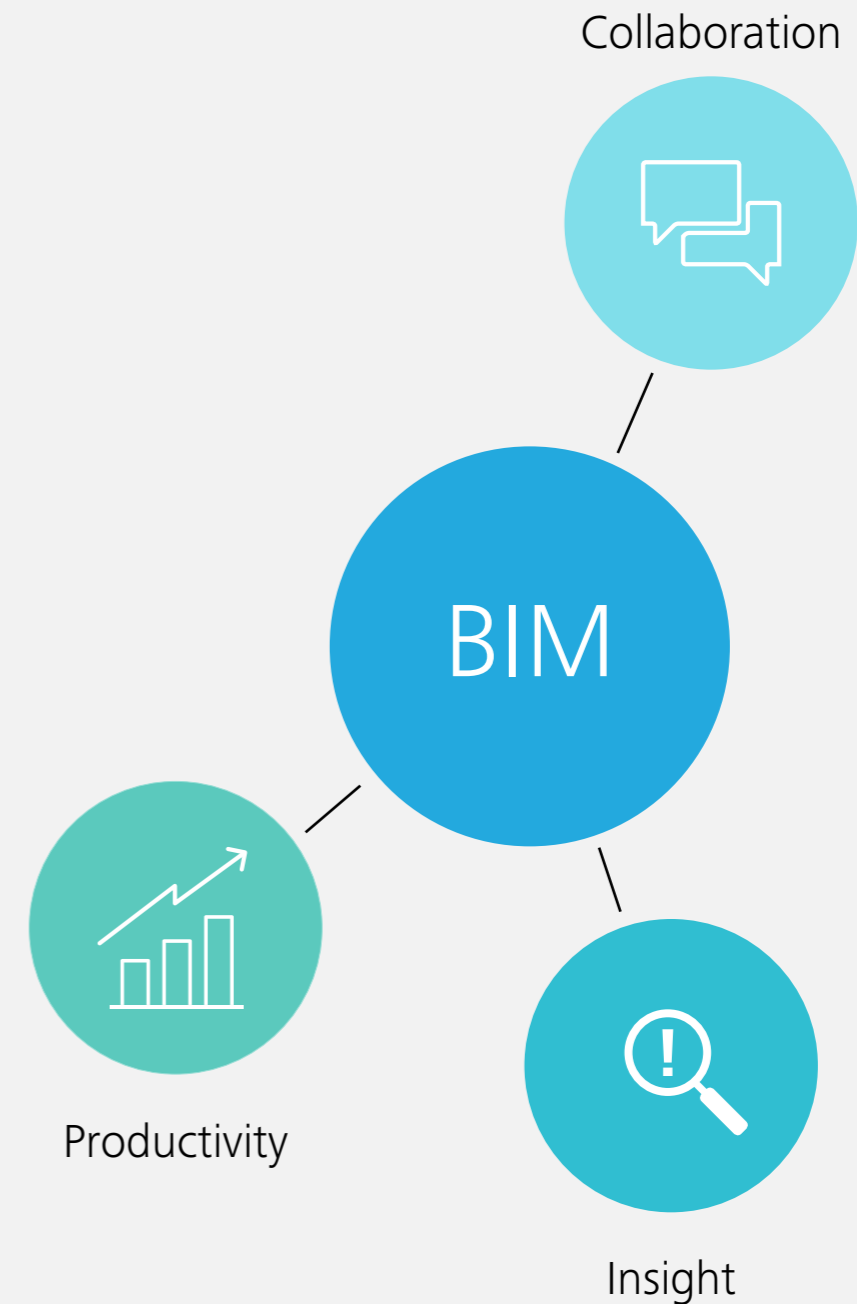




# What is BIM?

Simply put, BIM is a way to design, construct, and operate buildings that involves creating and using intelligent 3D models. Compared to traditional 2D drawings, these models give all stakeholders a better understanding of the project – leading to better, more predictable building outcomes.

How is BIM different from CAD? BIM is more than simply 3D CAD; more than just a 3D model of a building. BIM solutions use relational database technology to embed information and relationships into models, creating “intelligent” models.





## BIM models are intelligent in several important ways:

- The models contain **geometric representations** of the building and its constituent components, as well as the **large amount of associated project data** such as specifications, model numbers, warranty information, and so on.
- The models are **behaviorally correct**. Building elements such as beams and pipes “know” what they are, what they do, and how to react to the rest of the model.

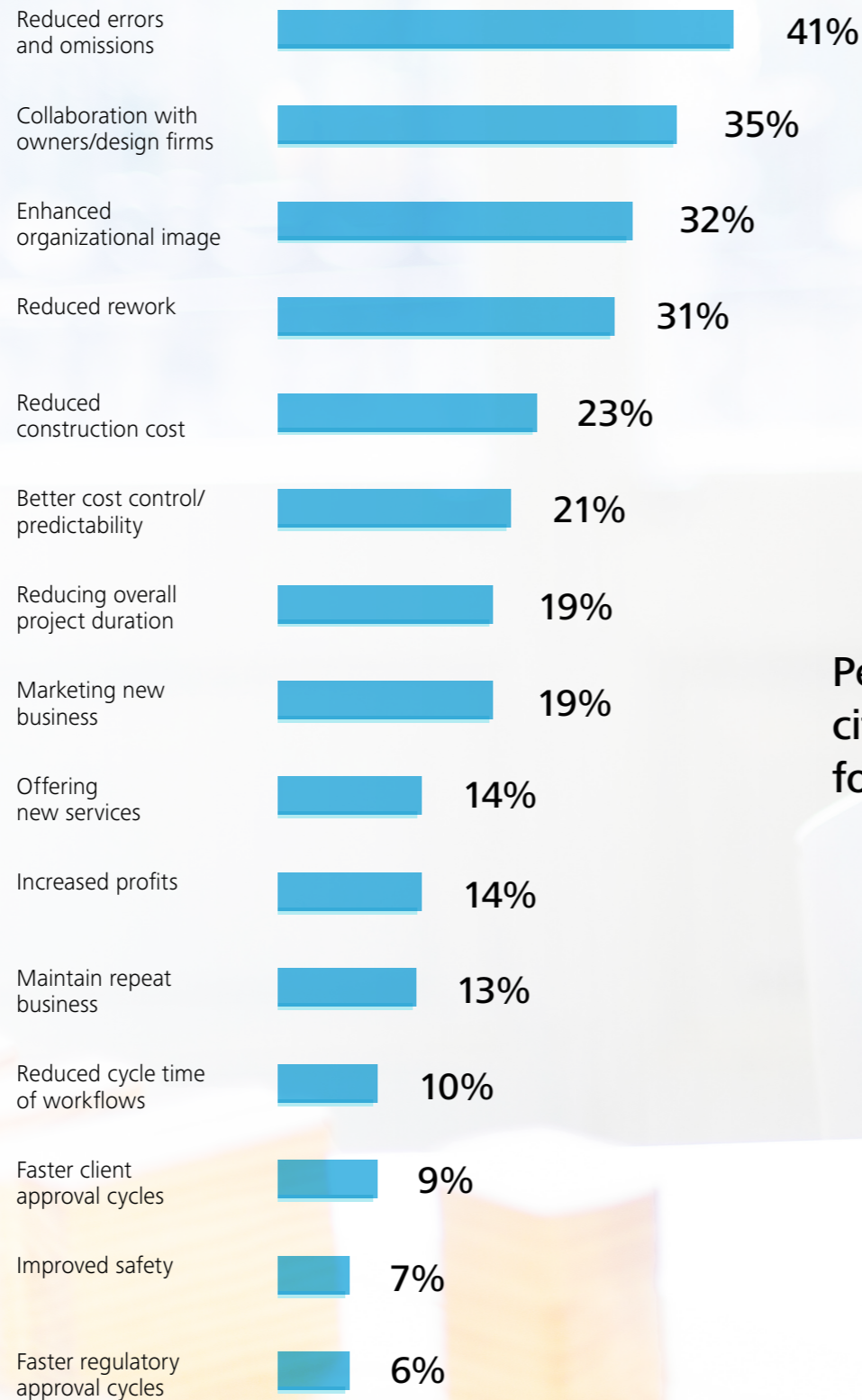
This built-in intelligence allows the models to be analyzed, visualized, scheduled, or quantified as a building assembly **made of real materials with real characteristics and functional relationships** – enabling important activities such as structural analysis, daylighting, project visualization, construction simulation, and cost estimating.

- The really critical “intelligence” behind BIM is **the automatic management of these model relationships**. The building model and all design documents are in an integrated database, where everything is interconnected. Drawings, views, schedules, and so forth, are direct presentations of the underlying 3D model.

Since the drawings in this sense are live views of the building model, they are always **accurate representations of the building design**.

**No additional effort is required** to keep project data in sync, and no manual intervention is required to keep drawings and project documentation in sync.





Percentage of AEC business leaders citing BIM benefit as one of top three for their organization

Source: 2012 SmartMarket Report "The Business Value of BIM in North America"





## BIM value

### Long-Term Benefits

Which brings us back to the original question. Can an architecture firm survive without BIM? The statistics, trends, and owner mandates, cited earlier all point to the same answer: no.

But this is good news... even for firms that have not yet adopted BIM. Because moving to BIM can give firms substantial and long-lasting benefits, enabling more innovative design and construction strategies and providing a significant competitive advantage.

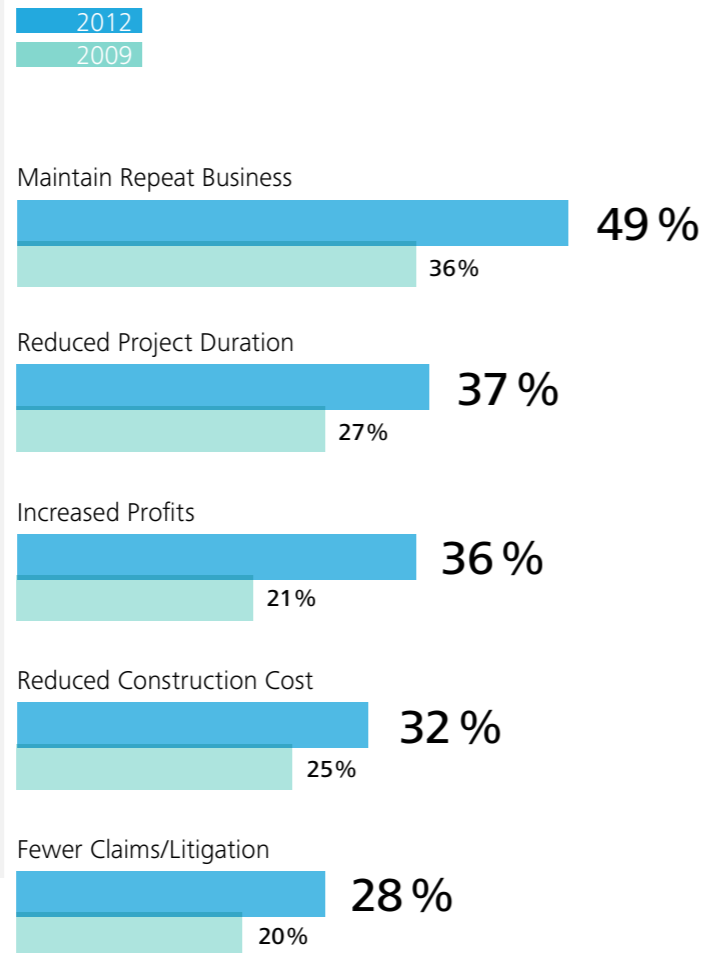
### Short-Term Benefits

Surveys of architecture firms who have already moved to BIM consistently list several top business values of BIM, such as:

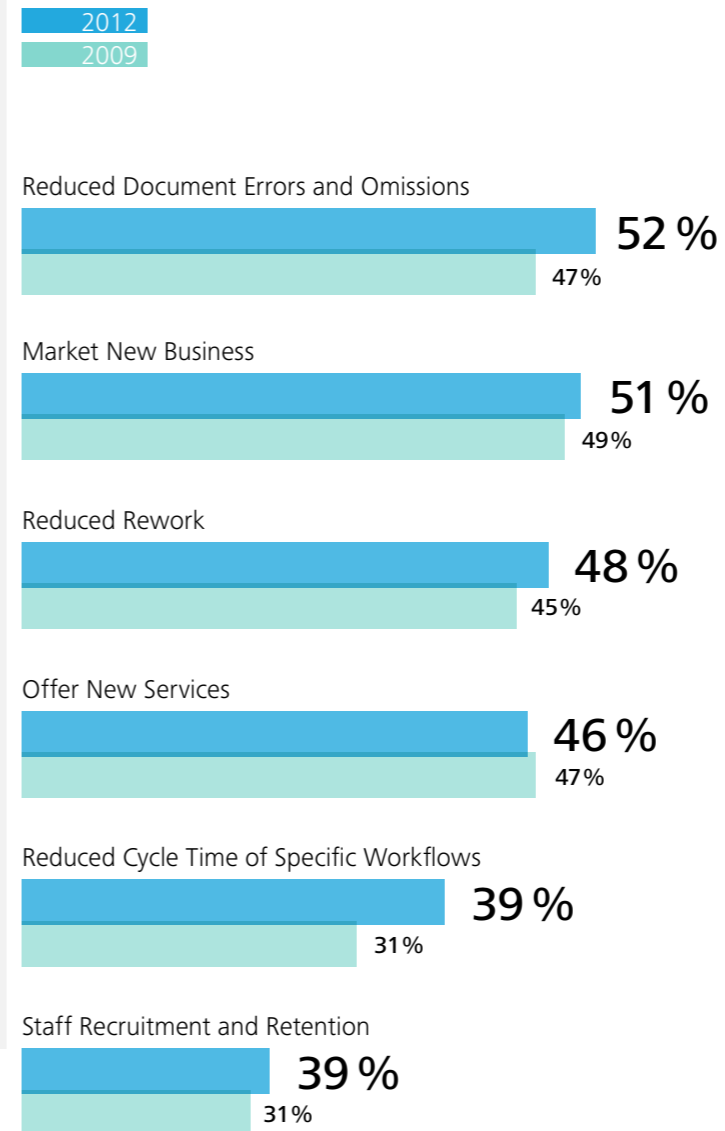
- > Reduced document errors and omissions
- > Reduced rework
- > Reduced project duration
- > Increased profits
- > Ability to win new business and garner repeat business



### Long-Term BIM Benefits



### Short-Term BIM Benefits



Source: 2012 SmartMarket Report "The Business Value of BIM in North America"





As model-based building design and construction grows – and intersects new technologies, new delivery methods, and new business models – the nature of the architecture industry is changing. The degree of collaboration, the kind of information flows, the risk-management scenarios, and the alternate project delivery approaches are all manifestations of this change. To survive, firms must strategically position their use of technology – starting with BIM.



To be competitive we couldn't sit back and wait for BIM to take over the industry; we needed to be at the forefront of BIM use.

*Norb Howell, BIM Manager, Gannett Fleming*

