

GETTING STARTED WITH BIM FOR CIVIL ENGINEERING

A Guide to Your First Project





Moving to BIM can seem like a daunting task.

The successful implementation of BIM requires a careful and structured approach that takes into consideration the many integrated components of a firm's business, starting with vision and leadership extending to individuals who will apply BIM in their day-to-day execution of projects.

Pilot projects are one component of a well-thought-out BIM implementation plan. This Guide outlines a framework to assist organizations in planning for deployment of BIM pilot projects.



OVERVIEW

-  What is BIM?
-  Framework for implementing a BIM pilot project
-  BIM vision
-  Driven BIM leadership
-  Getting started with your BIM pilot project



1. What is BIM ?

Building Information Modeling (BIM) is a process that begins with creating an intelligent 3D design model and then uses that model to facilitate more efficient design and documentation, better coordination, simulation, and visualization. BIM can help owners and service providers improve how buildings and infrastructure are planned, designed, built, and managed.

BIM can alleviate many of the business challenges that architects, engineers, construction professionals, and owners face by providing greater project insight earlier in the design and construction process to help them make more informed decisions.

On a project that takes advantage of BIM, information is coordinated and consistent, creating efficiencies throughout the project lifecycle.

BIM also improves planning, cost forecasting, and project control – making it easier for teams to collaborate and communicate.



What is BIM?



BIM Pilot



BIM Vision



BIM Leadership



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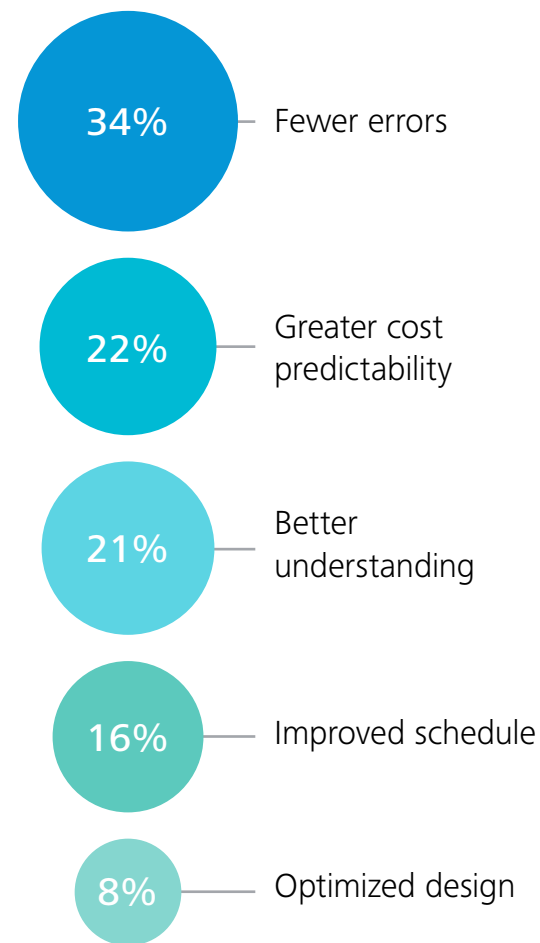




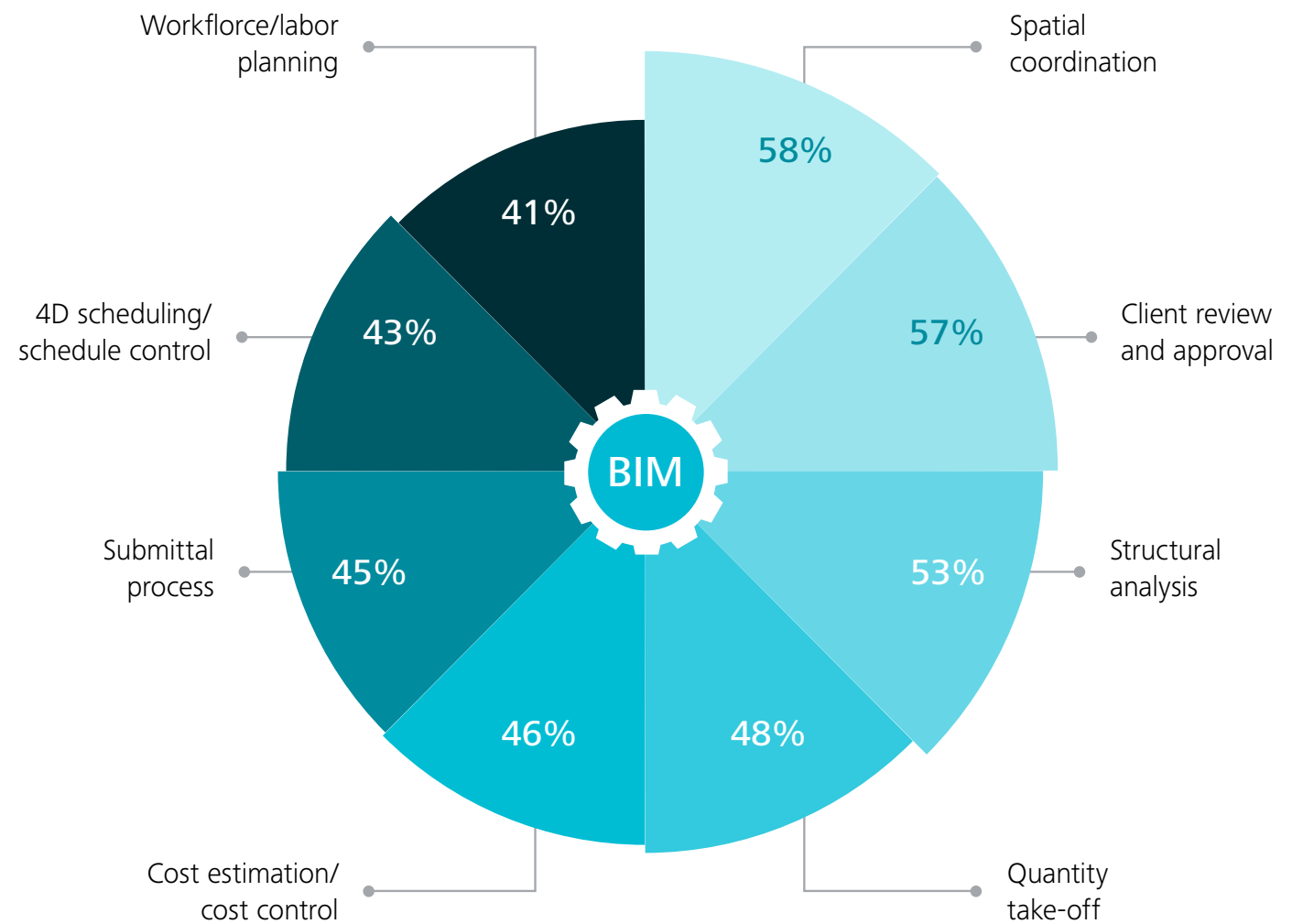
Inevitably, implementing BIM will impact your business and your processes, as well as your technology toolset. As you move to BIM you should be aware of how your organization’s business, processes, and technology might change, so you can better position your firm to reap the benefits of BIM.

Benefits of BIM

The majority (87%) of BIM users in the study report that they are receiving positive value from their use of BIM. Most believe that they have only just begun to experience the full potential.



Highest Value Project Activities



Source: Dodge Data & Analytics SmartMarket Report: "The Business Value of BIM for Infrastructure 2017"



2. A framework for implementing a BIM pilot project

No matter the size of your project, single discipline or multi discipline, there is a BIM implementation workflow that you can benefit from.

A BIM implementation must be supported by the business as a whole. It cannot be an IT initiative, or an R&D one, or done solely at a project or disciplinary level.

However, these same teams, when backed by the business's leadership team and supported by experts who are knowledgeable on BIM implementation, can initiate BIM adoption with pilot projects, measure their results, and realize benefits that can later be scaled companywide.

The implementation framework presented here is based on an organizational transformation that starts with executive vision and sponsorship and is carried out by an organization's leaders and its project workforce. The framework is based on three essential strategies, each integral to the performance of the others:



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3. BIM vision

Essential to the success of implementing BIM is a succinct and well-articulated vision from executive leadership.

The vision must outline what the BIM process adoption will achieve for the organization, what the principle elements of the transformation are, and what this evolution will look like at various stages. This isn't just a vision statement; it is a narrative of where BIM will take the organization.

Using published references and guides for implementing BIM standards and best practices such as these is a good starting point, but there is no established road map that will fit the situation of every organization.

... or the **Autodesk BIM Pilot Deployment Workbook** is a good starting point, but there is no established road map that will fit the situation of every organization.



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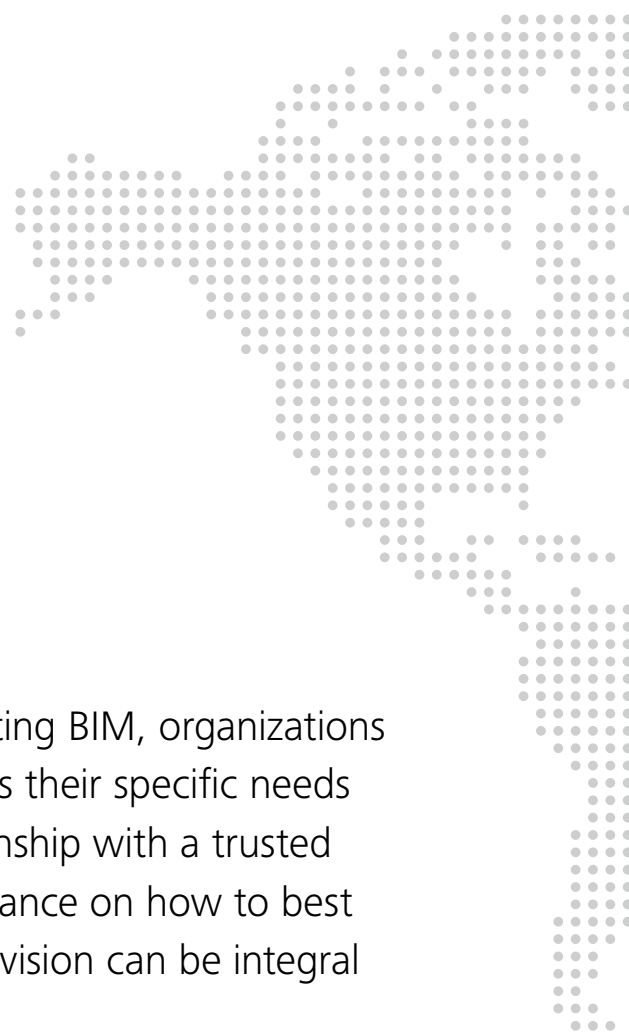
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Global BIM Standards and Guidelines

US

U.S. National BIM Standard

Pennsylvania State University's
BIM Project Execution Planning Guide and Templates

NYC – DDC BIM Guidelines

Denver International Airport BIM Design Standards

MASSPORT Guidelines for Vertical &
Horizontal Construction

EMEA

UK – BSi Standard Framework and Guide
to BS1192

Highways England Data & CAD Standard

Netherlands – Rgd BIM

Standard Finland – Building Smart

Germany Planen Bauen

APAC

Singapore – BIM Guide Version 2

To be successful at implementing BIM, organizations need a strategy that addresses their specific needs and business values. A relationship with a trusted advisor who can provide guidance on how to best to define and execute on the vision can be integral to the success of a BIM pilot.

To truly reap the advantages of BIM, executive leadership must be capable of positioning BIM within the overarching strategic objectives of the entire organization.



Considerations for creating an effective BIM vision:

Be inspirational and aspirational

The vision must be far-reaching and sufficiently aspirational to unite the various elements of the organization. A BIM pilot that is rolled out as a technology implementation exercise will not provide the momentum needed to sustain progress.

Educate

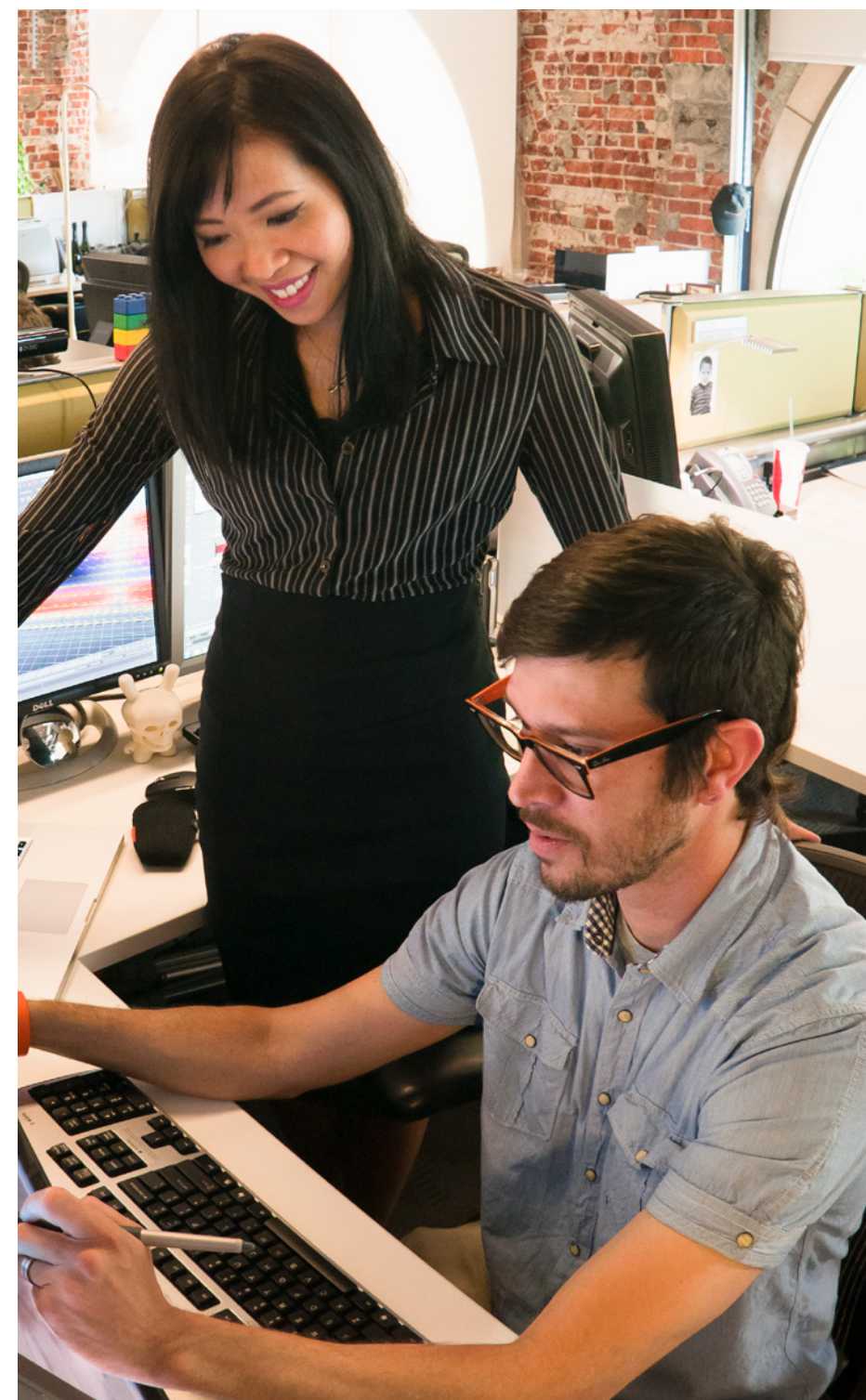
Executive leadership may need to be educated on BIM and consider its impact in setting corporate strategies. A good way to begin is to establish a relationship with a trusted advisor who has had success with BIM pilot implementation.

Define the five Ws

The *who*, *what*, *where*, *when*, and *why* will give each part of the organization the factual details of the BIM vision it needs. Some of the questions will be challenging to answer and may require executive leadership to take risks.

Set milestone accomplishments

Staggering starts and creating milestones helps the organization to overcome the initial paralysis of facing what might feel like a monumental task. Meeting those milestones also helps to create short-term “wins” that can generate energy and drive the momentum of the effort toward the vision end-state.



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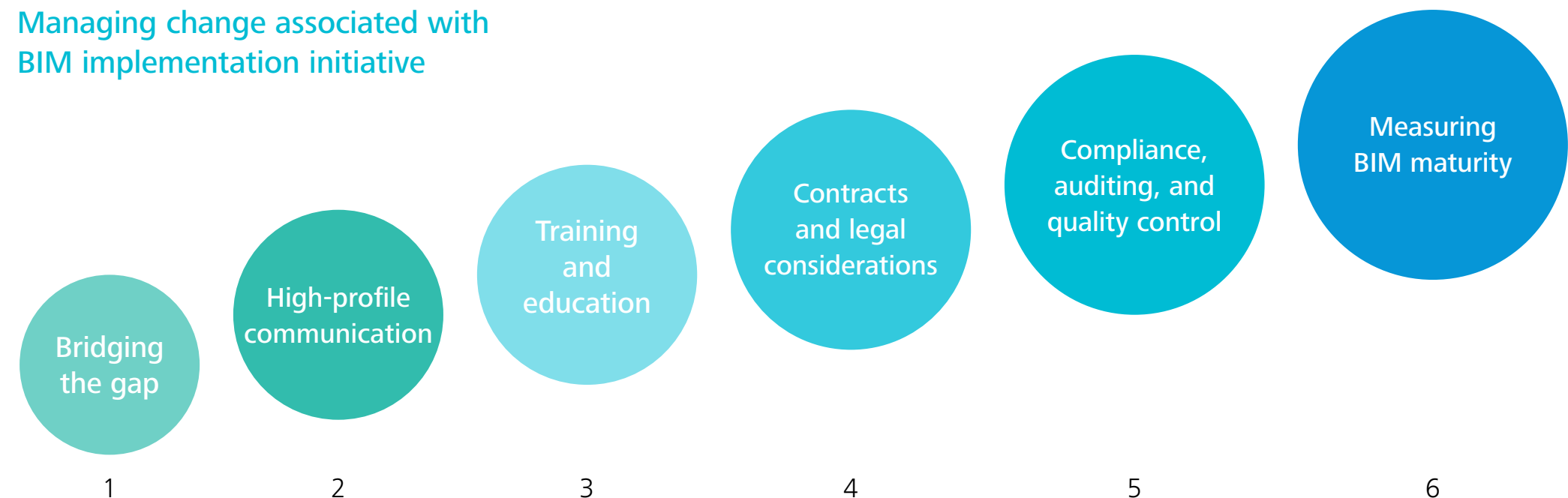
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4. Driven BIM leadership

The BIM leadership team must ensure that the BIM vision is translated into actionable tactics to produce the desired outcomes and performance in line with an organization's strategic objectives.

Managing change – lasting, sustainable change – in any organization can be difficult and requires creative strategies tailored to each organization's culture and particularities. Here are some tactics for:

Managing change associated with BIM implementation initiative



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1 Bridging the gap

Action by executives and BIM leadership must be accompanied by bottom-up approaches, such as assessments, education, and change validation through monitoring of milestones.

2 High-profile communication

A high-profile communication plan demonstrates to all stakeholders the organization's commitment to BIM, helps to inject energy into the transformation, and bridges the gap from executive theorizing to a daily reality.

3 Training and education

Adoption of BIM technology requires new skill sets and new ways of working, and that demands an investment in training to ensure you have the right people on the right project.

4 Contracts and legal considerations

BIM tools and their associated processes can impact the contractual relationship between owners and their delivery partners. BIM-enabled collaboration

is a significant change to traditional processes, which should be addressed up-front with project stakeholders.

5 Compliance, auditing, and quality control

Project reviews permit BIM leadership teams to evaluate lead measures and the effectiveness of BIM technology, standards, and processes in a pilot project. BIM leadership can catch errors, improve standards and processes, and replicate best practices.

6 Measuring BIM maturity

BIM leadership will determine key indicators to measure the organization's progress toward the goals and milestones laid out in the vision. One useful set of measures for BIM can be BIM maturity, which measures an organization's capability to perform BIM within the organization and on projects.





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5. Getting started with your BIM pilot project

With the groundwork done, it's time to pick a pilot project. BIM practitioners take a number of approaches that include completing a fictitious project or competition, re-doing a recent project as a comparison, or starting a new live project for a client. All are valid and will depend on the acceptable level of risk and manpower available to undertake your current work.

Any pilot should include measurement at all key stages to really understand how BIM has improved the design and/or construction process. The positive benefits to each stakeholder in the process should also be documented for any return on investment calculation.

Firms find that the more BIM projects they complete, and the faster and better they complete them, the higher return they get. Just like moving from

drawing boards to 2D CAD, moving to BIM may initially lead to some drop in productivity while the system is mastered. To assist with this, it is recommended that the initial pilot project team does not work on traditional 2D CAD projects and BIM projects simultaneously, which could be counterproductive to learning the new system.





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If a live project is an option, it would be ideal to select a client who embraces new technology and has an understanding of what BIM will do for them. BIM models offer many by-products and downstream benefits, such as facilities management and a clearer understanding of the original design intent.

Resistance to change is a common human trait, but so is our ongoing need to make advances in the way we work. Moving to BIM requires the positive support of management and key staff, even more so in larger organizations, together with setting the right expectations at the start of the process, formulating a road map, and ensuring the appropriate level of training for employees. By starting small and building confidence, and increasing core capabilities and experience, the transition to BIM will accelerate with each new project.



