Making Everything Easier!™

Building Information Modeling

FOR DUMMIES®

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Learn to:

- Design a building collaboratively using one coherent system of computer models
- Save time, money, and effort using BIM
- Reduce on-site errors through same-model team collaboration
- Create better buildings that will stand the test of time

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Introduction

Perhaps you keep hearing about Building Information Modeling (BIM) and want to work out what all the fuss is about. You may be a complete beginner in digital design and construction, looking for the basics. You may be a confident CAD user who wants to understand what BIM brings to the party. Or maybe you're already very experienced in implementing BIM processes and you're just interested in what we have to say in *Building Information Modeling (BIM) For Dummies.* We understand that you could be at various stages of knowledge and levels of experience. BIM is a process and it needs people like you to fuel it.

BIM isn't just a buzzword. It's actually been around for a long time, but the foundations to make it really work weren't in place before now. We've seen BIM generate new efficiencies and new challenges too, and we've also seen how construction is hit hard by global economic recession. Our aim is to give you the push you need to start, accelerate, or maximize your use of BIM. It's our great pleasure to guide you through your BIM implementation journey.

About This Book

More than likely, you've encountered a lot of conflicting, overly complicated, and unhelpful content about BIM online and in print. We intend to make *Building Information Modeling (BIM) For Dummies* different, cutting through all the noise and providing you with the clear advice and practical guidance that you need to make BIM a success in your job, whatever your level may

be. Think of this book as a reference guide that addresses just what you need to know about BIM.

For the purposes of this book, we want to make it clear that we use the terms *model* and *BIM* to mean quite different things. Throughout the book we refer to BIM only as the concept of information modeling for buildings. We use terms like *3D CAD, 3D model,* and *geometric/geometry model* interchangeably.

We structure this book to start with the basic concepts and ideas. We then gradually introduce more complicated, detailed, or supplementary content. Within this book, you may note that some web addresses break across two lines of text. If you're reading this book in print and want to visit one of these sites, simply key in the web address exactly as it's noted in the text, pretending that the line break doesn't exist. If you're reading it as an e-book, then you can just click the web address and the page will open in your default Internet browser.

One thing we should note is that we're all based in the UK, and that's where our expertise comes from, but we've tried wherever we can to balance this with a US perspective throughout and a global reference where relevant.

BIM is such a fast-moving target that during the writing process things shifted and new documents were released. We focus on pointing out the most current versions of guidelines and protocols that we reference at the time of writing.

Foolish Assumptions

Now, in order to write a practical guide to BIM and not just another boring textbook, we make some assumptions

about you, our dear reader. Those assumptions are as follows:

- You have some knowledge of the construction industry, probably in a professional capacity, in design, contracting, or surveying.
- You're a student, a client, or the owner of a building from a totally different industry, but you want to have a better grasp of a typical construction project, including the contractual relationships and expected information exchanges.
- You work for a company that has an interest in incorporating BIM into your processes and workflows.

You don't need to know how to use CAD software in order to gain insight from this book, because we think the software platforms are only one part of BIM and that model technicians are just one role in many BIM responsibilities.

You also don't need to have any project management background. We explain the majority of management concepts throughout the book, but you may find understanding how to implement BIM processes easier if you've run jobs or managed a project team.

Icons Used in This Book

We include icons in the left-hand margins that highlight particular parts of the text you may want to remember or pay close attention to. Those icons include the following:

This icon is practical, giving you extra information about how to do something or how to save time in larger tasks.

Remember icons highlight snippets of the book that you should commit to memory. Think of them like those bright sticky notes you may have on your desk.

Try to always read text with a warning icon. With this icon, we point out some pitfalls so that you can avoid BIM disasters, and we also emphasize actions you should take to prevent running into problems.

We flag the more technical information with this icon so that you know which parts are extra to the core content. You don’t have to read these bits to put the rest of the book into practice, although you may find this information interesting.

This icon points out supplemental information online at www.dummies.com/extras/bim.

Beyond the Book

With your purchase of *Building Information Modeling (BIM) For Dummies* in print or e-book form, you have access to more exclusive information online. From great checklists on BIM processes to quick practical articles,

you can find so many helpful pointers at www.dummies.com/extras/bim.

In addition, every *For Dummies* book includes a Cheat Sheet with handy information that you may want to consult on a regular basis. You can access the Cheat Sheet at www.dummies.com/cheatsheet/bim.

Where to Go from Here

Every *For Dummies* is modular, which means that you don't have to read it in order from cover to cover. If you're new to the world of BIM, we recommend that you start with Part I because it provides lots of the getting-started information that forms the foundations of BIM implementation. If you have a basic foundation of BIM, you can focus on Chapters 5, 6, or 7.

If you have the time, we suggest that you do read this book from cover to cover to get a complete overview of BIM and the reality of its implementation. You can see the overall picture when you're able to finally step back and benefit from the wealth of specific knowledge in this book.

If you're confident that you know all about the basics, you can jump into any part by going directly to it. For example, if your area of interest is the BIM mandates and protocols around the world, you can head straight over to Chapter 9. Alternatively, if you're looking into the legal aspects of BIM, you can flip to Chapter 14. If you're not sure where to start, consult the table of contents or index for a topic that interests you and then start reading.

Part I

Getting Started with Building Information Modeling

Go to www.dummies.com for bonus information about BIM and most any other topic that interests you.

In this part ...

- Find out how to explain what BIM is in a really simple way and understand what you really need for BIM implementation.
- Appreciate that BIM isn’t just for buildings, but suitable for all kinds of infrastructure projects too, and look at examples of how more efficient processes are impacting the industry.
- Make it easy to interrogate your project data by filling the model full of structured information, which other project team members can use for a variety of different uses and applications.
- Use the right modeling tools to develop accurate 3D object information and see the benefits of detailed modeling.
- Set up a common understanding of what BIM is for and agree on the fundamentals of BIM with your colleagues and project teams.

Chapter 1

Defining Building Information Modeling (BIM)

In This Chapter

- Exploring what BIM actually is
- Comprehending how BIM can help you
- Explaining the BIM plans and strategies you need to be successful
- Getting excited about BIM and encouraging others

The construction industry has been doing things the same way for thousands of years. Concrete is poured and set, bricks are stacked on top of bricks, and systems for heating and water are designed around corners and over multiple floors. For way too long, the construction industry has done a lot of these processes in isolation. At its worst, the construction industry brings some people involved in the construction of an asset like a building or a bridge onto the project just in time for their part, and the project team has to work around decisions or redo work, often on-site and under pressure of project deadlines.

Even in some of the most collaborative schemes, communication between different teams still has a long way to go, and the other users of building data and outputs, like clients and facility managers, are sometimes the last to know. The quality and quantity of

data they receive on a project can vary wildly. What you need is a way to involve the entire project team earlier and coordinate all the project information in clear and accessible forms.

If only a combination of processes and technology existed that provided the framework to improve communication and data exchange across the construction industry, no matter how large or complicated projects may be. Well, interestingly enough, you're in luck. This chapter serves as your jumping-off point to that very process: Building Information Modeling, commonly shortened to BIM.

Explaining BIM in Plain Terms

Here we provide a good definition for the term BIM so that the three members of your author team and you are on the same page. Frustratingly, BIM actually has lots of definitions, many generated by various organizations, because the subject has changed over the years. To prevent any confusion, we present you with our own definition that we think really clearly explains what BIM is and what it isn't.

Most people agree that the acronym BIM stands for Building Information Modeling, but a few folks argue for Building Information Management (and, to be honest, some other alternatives too). (The next section takes a closer look at what the three letters in BIM mean.) More often than not, though, BIM is now an accepted acronym, so you don't need to break it down further anyway, just like RAM for random access memory. We think that BIM is a process, so we could easily use both Modeling and Management in our definition. Here it is:

BIM is a process for combining information and technology to create a digital representation of a project that integrates data from many sources and evolves in parallel with the real project across its entire timeline, including design, construction, and in-use operational information.

Examining the A-B-Cs of BIM

BIM stands alone as a word in its own right, and you can feel confident using it, instead of having to say "Building Information Modeling" in full every time. But when it comes to understanding what BIM really is and explaining it to other people, those three letters can be a very useful place to begin. The following list gives a bit more detail about the A-B-Cs of BIM, or, more accurately, the B-I-Ms!

B is for banana

One of the best ways we've found to describe BIM to someone without any knowledge of it is to grab a piece of fruit. Explain that you could develop a perfect 3D replica of the fruit in digital modeling programs or even by 3D-printing a copy, but that's only one kind of representation of the fruit. It doesn't include any of the fruit's *data*; for example, its sugar content, calories, use-by date, country of origin, whether it has Fairtrade certification, and so on. The 3D object on its own isn't enough to represent the fruit. It isn't Banana Information Modeling. That's the difference between 3D CAD and true information modeling.

- **B:** Because the B in BIM stands for *building,* think of this as the verb *to build,* and not just the noun, as if BIM was for just physical, discrete buildings. In fact, you can apply BIM to infrastructure, civil engineering,

and landscape, along with large-scale public and private projects.

You're modeling a process, the act of building something. Refer to Chapter 2 for more information on what the B in BIM means and for help on BIM for infrastructure.

- **I:** The I in BIM is about understanding that unless you have *information* embedded throughout the project content, the work you're producing is telling only half of the story.

  You don't even really need to worry about the modeling in order to start applying BIM; you can put the processes and data exchanges into practice long before drawing work begins on a project. The real value in BIM is the ability to interrogate the model and find the data you need, when you need it. Turn to Chapter 3 for some great examples of information modeling from other industries, like aeronautics and automotive racing.

- **M:** The M stands for *modeling.* This aspect of BIM probably has the most history, and hundreds of programs for representing the built environment using 3D CAD techniques and virtual design and construction (VDC) are available. (In fact, the majority of free resources on BIM, especially in the United States, can put too much focus on the 3D modeling aspects of BIM.) Chapter 4 is about how the visual model should evolve in detail, but only as much as you require for the relevant output. The model should allow the output of whatever plan/section or perspective or walkthrough or 3D-printed model that you require.

One of the simplest ways you can explain BIM is that the project should be *built twice:* once fully modelled digitally and then again for real on the construction site.

After you comprehend the definition of BIM, the next step is to grasp what BIM is actually trying to achieve. BIM processes aim to make you (and the construction industry as a whole) more efficient, and to allow project teams to make savings in terms of cost, time, and carbon, and removing waste across the timeline. Chapter 5 provides a really simple overview of what BIM is trying to do and some of the key fundamentals you need to know.

Understanding the Requirements for BIM

Here's a list of what you really need for BIM implementation to thrive:

- **Digitization:** You have to be confident that the future of the industry is digital. Think about how technology has evolved in most industries and how in your experience of the construction industry you may have noticed that it's still traditional and paper-based. BIM implementation requires a change of direction, toward new tools and software and a digital future.
- **The right foundations:** In order to build advanced BIM processes, you need the firm bedrock of efficient systems for communication, information exchange, and data transfer. Think about what practical changes you may require and even the type of projects you

focus on. We show you how you can describe your BIM readiness in terms of levels of maturity. Chapter 7 discusses the importance of having a foundation before you implement BIM.

- **Process:** What's wrong with what you're already doing? We hope you can see where you can make improvements in your current processes, and that moving toward BIM implementation should have a positive effect on your business. Some essential elements to collaboration exist, and in Chapter 8 we show you an example of best-practice work flow and an explanation of some of the key acronyms you'll encounter.
- **Technology:** You need to ensure that you have the right technology to support your BIM aims and objectives. Technology includes software and hardware. Having the right technology enables you to work in a digital environment. In Chapter 21, we show you different types of BIM platforms and software, with some important examples and discussion points for when you have to make decisions.
- **Training:** All the processes, frameworks, and documents in the world won't help if people don't understand them and can't use the tools and methods you're implementing. So a key requirement is to support all the technology and protocols with dedicated and personal training. We point you towards some great resources you can look to for help in Chapter 22.
- **Incentives and business drivers:** *Incentives* are what motivates and encourages you and your organization to undertake BIM, whereas your *business drivers* refer to processes that are vital for the continued success and growth of your business. Some

business drivers may be outside business drivers; for example, economic conditions that a company can't always influence. The UK is mandating BIM from 2016, and the United States, although still behind, demonstrates huge potential for standardization. In Chapter 9, you can read about the UK Government Construction Strategy and where the BIM mandates came from, and compare it with BIM uptake in the United States and across the rest of the globe.

- **Standardization:** For BIM to thrive, you need interoperability. Interoperability is a term that's important in BIM-speak. *Interoperability* is ensuring that you can use the outputs someone else in the project team has produced, because you're all using standard formats. Other BIM standards exist, along with a range of recommended protocols, guidelines, and specifications for the properties of objects you use in your models in the form of information exchanges. In Chapter 9, we help you navigate through these documents and show you how everything could evolve.

A very brief history of BIM

Even though there's been a recent push to implement BIM and a realization of its benefits, BIM isn't a new concept. The earliest use of the term *building modeling* was in the 1980s, in a paper that predicted that model objects would connect to relational databases full of different kinds of information. And long before that, college research teams were developing computer modeling techniques with buildings in mind. Even just on the graphical side, university research has had a significant impact on modeling advances.

Software companies have been developing tools for built environment professionals to design, plan, render, and analyze buildings and structures for decades. Although most have focused on 3D geometric modeling systems, the largest platforms have been exploring how to make the most of data science and the properties of building products too. The first use of the term *BIM* to describe all this goes back as far as the 1990s. The awareness,

investment, and supporting documentation have all increased dramatically in the past few years, though.

For more information on the history and theories of BIM, we suggest that you check out some great books by the fathers and godfathers of BIM such as *The BIM Handbook* by Chuck Eastman, Paul Teicholz, Rafael Sacks, and Kathleen Liston (John Wiley & Sons, Inc.) and *Building Information Modeling: BIM in Current and Future Practice* by Karen Kensek and Douglas Noble (John Wiley & Sons, Inc.).

Considering BIM Plans and Strategies

Having a clear plan and strategy is essential to the success or failure of your BIM journey. You'll need an overall strategy for encouraging BIM in your office or on-site. Use the BIM protocols and frameworks to refine and improve your processes and quality assurance, and develop individual BIM execution plans for particular projects.

So that BIM processes have the best possible chance of becoming everyday practice, you want to make a start with your current team and your next project. In Chapter 13, we show you what having a BIM strategy really means and what benefits you can expect from new methods of working. To help you do this, we also present a couple examples of different BIM strategies:

- **BIM in the UK:** You can use the UK's suite of BIM documents in combination with your preferred tools and supporting platforms to achieve BIM Level 2 and what it's going to take to progress to Level 3.
- **BIM in the United States:** In the United States the same clarity of a national approach doesn't exist, but we direct you to a number of useful protocols and

guidelines from certain states and BIM organizations, so that you can begin to build an efficient set of BIM processes and workflows.

Like everything in life, BIM also has some associated risks that you need to be able to identify. Some of those risks include

- **Digital security:** Sensitive information about the operation of assets
- **Intellectual property misuse:** Answering who owns the property
- **Risk and liability:** Recognizing who is responsible if something goes wrong

Chapter 14 discusses these challenges, what you can do to avoid them, and how to handle them quickly if you should encounter them.

Measuring the Real-World Benefits of BIM

Say that you've won over some key decision makers in your organization and they need you to produce a business case for BIM. As part of your business case, you need to justify the *capital outlay,* which relates to the money your organization spends to implement BIM. You also must consider upheaval that will come from new technology, new team structures, and even new staff. Not only that, but you probably have to demonstrate return on investment (ROI) as quickly as possible.

Your boss is going to want to know how much BIM is going to cost. BIM needs to generate savings and efficiencies that make it worthwhile. In Chapter 15, we pass on some solid examples of BIM benefits that aren't just aims for the future but exist in the real world today, including the following:

- **Better information:** Because you're going to be working with digital data and methodologies in the office or on the job site, the accuracy and currency of your information will improve, including precise quantity takeoff and the ability to set the site out such as the asset's position, levels, and alignment from the model.

  Not only that, digital information also allows you to test and validate the data far more quickly than with traditional processes. As the model evolves, instant awareness of the impact of changes at any point in the project leads to better assessment and rapid decision-making.

- **Data exchange across the project timeline:** BIM can help you to avoid data loss over the course of a project. At many points of information exchange, you can use project data more collaboratively with little waste or duplicated effort.

  What's even more important is that multiple roles and disciplines can use the same data on the project, including cooperative working with the supply chain and project participants further down the timeline, like facilities management and operations teams.

- **Communication:** BIM is your best chance to give your clients the built asset that they actually want and to output the deliverables that meet their own objectives, from slick visualizations to high-quality carbon data. Through a combination of 3D and nongraphic data,

you can understand more about the built environment than ever before. Even better, you can also test out ideas in the safety of the model.

- **New efficiency:** The potential accuracy of BIM and the chance to refine engineering long before ground is broken on-site means that projects can begin to exploit new concepts like off-site manufacturing (OSM) where manufactures can deliver pre-built construction elements to site.
- **Carbon saving:** You can calculate statements about energy use and embodied carbon with new levels of detail. By running simulations and testing lifecycle concepts in the model environment as early as design and pre-construction stages, you can be more confident about the future performance of your asset. You can also have greater certainty over the project program and the likely issues that could arise.
- **Health and safety:** By improving information at the front end of BIM (including getting contractors and subcontractors on-board early), you can understand areas of risk in the project, especially where dangerous activities will take place, and achieve high levels of safety during later phases of the project. Throughout this book you can find examples of construction and site delivery of BIM, not just office-based BIM for designers. Chapter 16 specifically looks at some of BIM's impact on construction, especially the potential for BIM to improve health and safety on-site.

As well as including all the information about BIM's effect on projects today, we take a good opportunity to understand the future of the industry and where new technology like augmented reality (AR) could take BIM and digital construction in Chapters 18 to 20.

The construction industry is finally being disrupted by innovation and new business methods. It won't be long before the buildings and projects you're working on are more connected than ever. You may have heard the term *smart cities,* and BIM is one of the main generators of the embedded digital information required to achieve the connected globe. Through the addition of more smart building sensors, and what's called the Internet of Things, your understanding of how people really use the built environment (and your own projects) will improve beyond anything you could have previously imagined.

Encouraging BIM in Your Workplace

The amount of software and industry documentation you throw at an office doesn't matter, because so much of BIM implementation is about changing real-world processes and engaging individuals, with their various concerns, agendas, and opinions. How do you go about integrating BIM into real teams with real people?

People are the pulse of BIM, and you need to understand that the same BIM and the outputs it can generate are going to be used by different (and new) roles in the industry, at different times and in very different ways.

You can encourage people to embrace BIM by

- **Leading by example:** Be a BIM champion and lead by example with your commitment and enthusiasm.
- **Showing support:** Give support and encouragement by identifying and providing any training needs.

- **Communicating:** Deploy simple but clear messages about why and how you're implementing BIM.
- **Providing feedback:** Listen to other staff members and provide any reassurances that they may need around fear of change and the unknown.

There are various processes to BIM and many potential users involved. In more detail, Chapter 12 looks at encouraging BIM processes, and Chapter 17 focuses on BIM users and roles from inception to demolition (and beyond).

Our experience with BIM

We co-authored this book because we all have varied experience, from large contractors to small architectural practices. We've seen everything from the genesis of BIM for landscape to the development of ground-breaking software and documentation, including the various protocols and standards that the industry needs to communicate better, to evolve new methods, and to increase innovation.

BIM will continue to impact all areas of construction design, build, finance, management, and operation, and the relationships between all the parties involved in a project, both cooperatively and contractually. We think everyone can work together in more collaborative ways, toward a creative tomorrow that makes the most of diverse groups of people. Digital cooperation and access to information isn't just the heart of BIM; it's the heart of a connected, global society.

So are you ready? We want to make sure that you don't miss the BIM boat!

Chapter 2

Explaining the Building Part of BIM: It's Not Just Buildings

In This Chapter

- Introducing the "B" in BIM
- Recognizing the types of projects BIM is suitable for
- Exploring the use of BIM for infrastructure
- Delving into BIM as a process

BIM can seem like a bit of a strange term, and part of the reason it can be so difficult to explain what BIM means is that the letters don't always help you out. This chapter, Chapter 3, and Chapter 4 take each of the letters of BIM in turn and look at what they mean. This chapter focuses on the B in BIM.

As we discuss in Chapter 1, the B in BIM stands for *building,* which is true of most definitions of BIM. To avoid any misconceptions, this chapter makes sure the B in BIM doesn't restrict your view of what BIM is capable of.

Understanding What Building Means

What do you think of when you hear the word *building*? You may think of a physical building like an office, school, stadium, hospital, or house. In that case, BIM refers to information modeling for a single building,

including all of the geometry and data for architectural and structural design, mechanical and electrical engineering, and so on.

Actually, building can mean a lot more than just that. The following sections explain that building is a misunderstood word and that BIM can actually be used in many varied industries and projects. If you think of building as a verb, not a noun, you can see that Building Information Modeling is a process, not just a final product.

Building isn't a helpful term

What makes understanding the building part of BIM difficult is that the word *building* isn't clear: it can mean different things to different people.

Try to describe what a building is. Doing so isn't easy. You can say that buildings are manmade structures, but what separates a building from a statue or monument? You can say they're permanent constructions with walls and roofs, but you'll be able to think of temporary buildings you've seen and also tunnels that have walls and roofs. In fact, one of the best ways to describe a building involves describing things that aren't buildings, and even that's confusing. Is a bridge a building? Is the Eiffel Tower a building?

The term *building* originally comes from ancient words for house. That's why people can think of buildings just as spaces they use for living or working or leisure.

Building as a verb, not a noun

If you think of building as a verb, meaning the same as construction or the process of putting things together, then that begins to expand what BIM can apply to. Then BIM isn't just suitable for buildings, it's the act of building things, such as the following:

- Bridges
- Railways
- Highways
- Utilities

You can also imagine how it’s suitable for other built environment sectors like

- Land surveying
- Landscape architecture
- Tunneling
- Mining

Some people say that the B in BIM proves that it works only for buildings and just doesn’t work for their discipline like tunneling or highways, but this simply isn’t true. Every sector is at different stages of exploring BIM, and great examples already exist of those industries using BIM on live projects, so you shouldn’t get hung up on the word *building*. For example, the Virtual Construction for Roads (V-Con) project is a European initiative to improve data exchange across civil infrastructure teams by using BIM processes and it’s changing road procurement in the Netherlands, Sweden, and France.

BIM also isn't just about architecture. Although the building design and construction industries have been the first to adopt the BIM processes and protocols as a group, BIM works for offshore projects, civil engineering, and infrastructure too. The documentation and support is increasing quickly for every sector.

Think of the B in BIM as meaning building as in the verb *to build,* the action of constructing things. Doing so helps you to understand BIM's reach in two ways.

- **It increases the sectors that information modeling applies to, sectors that build other things than just buildings.** BIM has been successfully demonstrated in
    - Architecture and building design
    - Civil and structural engineering
    - Energy and utilities
    - Highway and road engineering
    - Landscape and land surveying
    - Offshore and marine architecture
    - Rail and metro transport engineering
    - Services and engineering
    - Tunneling and subway architecture
    - Urban master-planning and smart city design
- **It demonstrates that building is a process.** It's not a one-time exchange of data; it's many exchanges

over the life of a project. The majority of model inputs are going to be in the design and construction phases, and the majority of information outputs will be extracted during handover, use, and asset maintenance. The information modeling for the building process could start on day one and still be going strong years later.

In the same way that describing one building that sums up all the buildings in the world is really difficult, summing up BIM using just one example of how it's been applied is impossible. You can use BIM for every kind of construction project, from giant bridges to manmade islands and even rollercoasters! BIM is a term that has become popular gradually, but it could have just as easily been Construction Information Modeling or Project Information Modeling.

Thinking about the built environment

The *built environment* is very varied and broad in its scope and includes lots of structures that aren't buildings. When you're talking about BIM, make sure that you're not just talking about architecture and the architecture, engineering, and construction (AEC) industry. A lot of the diagrams and visualizations you see in BIM presentations are of shiny skyscrapers or complex building forms, but people are using BIM workflows elsewhere in the built environment in other ways:

- **Infrastructure:** *Infrastructure* is the network of systems that keep things moving, whether that's water, gas, electricity, traffic, or Internet data. The design, construction, and maintenance of these structures need to use the whole lifecycle approach of BIM. For instance, Crossrail (www.crossrail.co.uk) is the

largest construction project in Europe and, among many projects, involves the tunneling of 26 miles of brand new underground subway lines. Every aspect of the project, from tunnel engineering to new underground station designs, has used innovative BIM processes for data management and lifecycle operation.

- **Geographic information systems:** Most built environment projects begin with site and land survey information. You can use *geographic information systems (GIS)* to visualize mapping and geolocational data so that the site information becomes part of the BIM. This is vital for city-scale projects. You can then add existing recorded data to the model, so that you can predict the impact of projects on traffic management, population density, or economic factors. It's really exciting when you start to think about doing it on a national or international scale.
- **Landscape architecture:** Landscape has been one of the most neglected sectors in terms of products and platforms that support the detail of landscape projects. Don't think that landscape is just tree and plant selection either; most landscape designers are involved in site modeling, level sculpting, and the overall aesthetics and performance of a scheme. For large infrastructure projects, the scale of forestry, wildlife, or water management can be epic. The platforms still leave a lot to be desired, but more landscape architects are able to coordinate their information with the rest of the construction team.

We should point out that our focus is primarily on Western design and construction practice, especially

looking at BIM in the UK, Europe, and North America. However, a huge amount of BIM uptake occurs in Asia-Pacific regions, South America, and Africa. Increasingly, more information is becoming available about BIM implementation in those territories. We hope that the publisher of *BIM For Dummies* will let us do another edition to keep you updated!

Seeing How BIM Can Help You

Whatever type of project you're working on, you can apply the methods and processes of BIM to generate new efficiencies. Don't forget that you'll be building a digital representation of every aspect of the project. Some of the data is drawn, much of it in the form of information embedding.

Chapter 3 looks at information modeling and Chapter 4 at geometric, 3D-CAD modeling, and you may be thinking already that BIM sounds complicated, but you're familiar with a lot of the concepts already. This chapter demonstrates how making BIM processes second nature on your projects can benefit your work flow and the wider industry. The following sections look at some of the key incentives for using BIM processes and help you to make a decision about whether BIM is suitable for your project.