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"BIM is a team sport. BIM’s greatest impacts are due to the new level of collaboration it makes possible."

- David Ross Scheer, AIA, LEED

PROJECT MANAGEMENT

10 TIPS FOR EFFECTIVE PROJECT MANAGEMENT WITH BIM

By David Ross Scheer, AIA, LEED

Building Information Modeling (BIM) has gained wide acceptance in the A/E/C industry in recent years as a design tool. Its usefulness for Project Management is less well recognized. Nevertheless, BIM offers Project Managers tools that can reduce errors, help them manage their teams more effectively, help create and stick to aggressive yet realistic budgets and schedules, enhance their clients’ experience, and expand opportunities for future work for both repeat and new clients.

Here are 10 tips to help you make effective use of BIM in Project Management.

1. **BIM is a team sport.** BIM’s greatest impacts are due to the new level of collaboration it makes possible. Every member of the project team needs to be on board (see #5 below).

2. **Rethink everything.** Don’t think of BIM as just another way to do what you’ve been doing. Rethink every step of your process and ask how BIM’s coordination, communication, and calculation capabilities can improve it.

3. **Take baby steps.** If you are new to BIM as a Project Manager, start with one, small project as a trial balloon. Learn from your successes and mistakes. Keep notes so you can share what you’ve learned with others in your firm.

4. **Deliverables = data + format.** With BIM, it’s not enough to know what information your team is expected to deliver. Since we’re talking about data, you also need to know in what format each type of information is needed (see #5 below).

5. **A good BIM Implementation Plan is essential.** This Plan details how each member of the team will use BIM, who is responsible for which parts of the model, what information each team member needs from the others, and how information will be shared. It should ideally be created in the process of preparing your proposal since it addresses factors that affect your costs and schedule.

6. **BIM templates save time and improve results.** A BIM template is the file you start a project BIM with. It can contain a great deal of information about the project even before the project begins. At a minimum, it should contain the layers or levels for the project, the standard BIM objects or families your team will use, basic model views, graphic standards and sheet layouts.

7. **Get under the hood.** You don’t need to become a computer programmer, but you do need to understand the capabilities of the software and adapt them to your specific needs to get the greatest benefits from BIM.

8. **Think client experience.** BIM gives you many opportunities to enhance your clients’ experience by keeping them more involved in the project. These include more frequent updates, visualizations to help them understand the project and data analysis to show them that they’re getting what they need.

9. **Test concepts early.** Use BIM’s analytical tools to study as many design alternatives as possible before committing to one for further development. Plug-ins and third-party tools can help extend these capabilities.

10. **Update your contracts.** BIM-based projects need new contracts to address the different benchmarks and deliverables they involve. The AIA E-Series Documents are a good place to start.

David Ross Scheer received his MA from Yale University in 1984. His firm pioneered the use of building information modeling (BIM) which has been central to his practice since 1996. He is the author of the recently published *The Death of Drawing* and is the instructor of PSMJ’s new BIM Optimization Bootcamp.
CONTEXT SENSITIVE DESIGN – COMMUNITY ENHANCEMENT OR GIANT DISTRACTOR? by Michael Ellegood, P.E.

When we in Public Works build a project, we are forever changing our community. It does not matter whether the project is a school, a library, a water treatment plant, a road, bridge, or even the lowly drainage channel. The project becomes part of the landscape and fabric of the community. Thus the project can enhance the community, help destroy the community, or, as is often the case, do both.

Consider a roadway improvement intended to increase capacity, travel speeds, and safety. While such an improvement can enhance connectivity between points A & B, they can also divide a community by bisecting it. Context sensitive design notionally recognizes these impacts and is a disciplined effort to balance the need for the project with the needs of the local community and the long-term impacts of the project on the adjacent properties.

Historically, we have delivered our projects using a three-step method:

**Define the Need**

**Design the Project**

**“Sell” the project**

This is a technical needs-based approach that is “sold” through the public information process only after a technical solution is determined.

In my own personal experience as a one-time head of a flood control district, our agency was bisecting residential communities with concrete lined trapezoidal channels to “keep them safe from flooding.” This divided the community and became the graffiti lined place where old bicycles and shopping carts went to die. I swore to end the practice—hence I introduced the notion of a “kinder, gentler flood control district” using context sensitive design principles.

The context sensitive design approach recognizes that projects impact the community and seek to minimize the adverse impacts by early recognition and by employing collaborative, interdisciplinary teams to solve the larger problem. It maximizes the use of community input to fashion solutions; it encourages the use of landscape architecture practices combined with solid engineering practices and community involvement practices to arrive at a consensus solution. Note that in a consensus solution not everyone is going to be happy but all parties can “live with” the preferred alternative.

The advantages of this approach to the community are apparent, but what about to the team charged with delivering the project? If we consider the top five reasons why our projects are delayed, one is a lack of public acceptance—public push back just before the project goes to construction at its most sensitive time. Using CSS principals, the public objections are learned early on and can often be addressed before the design is finalized and costs escalate. CSS is based on open and continuous community collaboration so the project becomes less of one that is “inflicted on the community” to one that includes the concerns and considers the visual, social, cultural, and economic issues.

What are the downsides, the risks? There are many:

- **It can cost more than a simple technical solution.**
- **It can take longer as public input is taken, evaluated, communicated, discussed, and included.**
- **Often, the technical considerations are subordinated by the public in favor of other aesthetic or community enhancement concerns.**
- **It can get political.**

Context sensitive design can serve the public agency and public project delivery well. For more information, take a look at the AASHTO website.

Michael Ellegood, P.E., has over 40 years of project delivery experience both as a private consultant and as a county engineer/public works director. He has developed and presents highly acclaimed project management seminars for public works agencies in the US and Canada. He is a Senior Consultant with PSMJ Resources and a frequent contributor to PSMJ’s Project Management journal. He can be reached at mellegood@psmj.com.

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**A/E PULSE POLL OF THE MONTH**

**How often are clients requiring the use of BIM on their projects?**

- A. Never (0% of clients/projects)
- B. Very Rarely (1%-20% of clients/projects)
- C. Sometimes (21%-50% of clients/projects)
- D. Frequently (51%-80% of clients/projects)
- E. Very Frequently (81%-100% of clients/projects)

http://go.psmj.com/dec2014aepulsepoll

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American consumers are expected to spend $4.61 trillion less on energy between now and 2030 than was originally projected in 2005, according to the U.S. Energy Information Administration. This is especially relevant to the A/E industry, being that buildings account for the majority of energy use and carbon emissions in the U.S.
THE 5 PHONE APPS I CAN’T LIVE WITHOUT

by David Whitemyer, AIA

Like everyone, my smartphone is littered with apps, many that are used for personal reasons, a few that I hardly touch, and a group that are essential to project management toolkit. Here are the five phone apps that, as a project manager, I use all of the time, and cannot live without.

Todoist

I live and breath by my to-do list, probably to the point of OCD. I’ve tried multiple paid and free to-do list apps and task-management tools, but the one that I’ve stuck with the longest and have completely fallen in love with is Todoist. Not only do I have it on my iPhone and iPad, Todoist’s browser-based app is open on my computer all day long.

Todoist allows users to set up multiple “projects,” and within those, limitless tasks and subtask can be added. Users can add notes and reminders to tasks. I’ve set up a number of my regular tasks to automatically send a text to my phone when it’s near due.

Evernote

For taking meeting notes, I use Evernote. When planning a business trip and needing to store tickets and confirmation info, I use Evernote. For outlining project schedules and agendas, I use Evernote. And for storing and sharing sketches, I use Evernote.

Originally billed as a note-taking app, Evernote has grown to so much more, and features loads of free plug-ins that make it even more robust. Like Todoist, Evernote is available as an app on both phones and tablets, and can be run on a computer through either the browser or the download app. And of course, these all sync together seamlessly.

TurboScan

Years ago I embraced the idea of a paperless office, and although I’m not there yet, I’m getting close, and TurboScan helps. Using the phone’s camera, this app scans documents and photos of any size, and to an impressively sharp resolution. You can then email PDFs or JPGs of the scanned items directly from the app.

This is great for shop drawings, RFIs, and sketches-on-the-fly. With paper shop drawings, I redline a set, grab an image of each sheet with TurboScan, and then email the PDFs to both the contractor and the client. The app also allows users to add pages to a document, so you don’t have to scan and send each page individually.

Camera

There is a plethora of camera apps available for smartphones. I’m quite happy with the native iPhone camera app. The camera is essential for project management work, for easily taking site photos and documenting meetings. At pre-bid meetings I always take a snapshot of the attendance roster so that I can later research our competition.

I also use my phone’s camera for grabbing images of buildings and construction details I see when walking or driving around the city, which is incredibly helpful when trying to describe them to my detailers or client. You know what they say! A picture is worth a thousand words.

Flipboard / Zite

It’s a toss-up between Flipboard and Zite and so I regularly jump between them. In fact, Zite is owned by Flipboard. These iPhone apps are what I use to soak up just about all of my daily news and A/E industry-related content. How is this helpful to being a project manager? Because when I chat with clients, prospective clients, and members of my project teams, I like to sound intelligent and know what’s going on in the world and in our industry.

With both of these apps you can set up tagged news interests, so only those subjects stream through your device(s). You can also read content from quality sources such as DesignIntelligence, ArchDaily, and Fast Company.

What are the apps (iPhone or Android) that you simply cannot function without as a Project Manager? Tell us! Send an email to editor@psmj.com.

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According to PMI’s 2014 Pulse of the Profession report, project managers are 12% more successful with initiatives when the organization provides ongoing project manager training.

30%...

the average amount of A/E projects that don’t meet either their original schedule or budget, according to DesignIntelligence.
WHAT IS LEVEL 2 BIM? WHY DO WE NEED TO THINK ABOUT IT? by Charles Nelson, AIA, LFRAIA

I’m no BIM expert, just an interested bystander. My perspective is a “helicopter” view, not a coal-face view. This paper is not written for BIM experts, but for people who are still confounded by the complexities, acronyms, and uncertainties of BIM.

In the US, and much of the rest of the BIMing world, we speak of 3D, 4D, 5D and 6D BIM. Most firms that say they are “doing BIM” are using 3D (or three dimensional) parametric modelling software: AutoCAD Revit, ArchiCAD, Bentley, or one of the other proprietary software systems.

At the risk of over-simplifying these concepts, 4D BIM adds time and scheduling to 3D. 5D BIM adds cost-related information to the 4D model. Then there is a quantum leap to the 6D model, which adds life-cycle management data to the 5D model. The 6D BIM model becomes a tool that is used by owners and facility managers to maintain the project after completion, and is the logical development of the BIM concept.

So, then, what is “Level 2” BIM? It’s UK terminology. At present, the UK government, supported by the RIBA (Royal Institute of British Architects) and a number of other key groups, is arguably the world’s most determined player in the BIM world today. As of 2016, all UK government projects will be required to use Level 2 BIM, and that deadline is spurring huge thought (and action) across the A|E|C community in the UK.

This is a big change from only a few years ago, when the US Government Services Administration (GSA), together with the American Institute of Architects (AIA) were the heavyweight players. (See my companion article “The Cutting Edge of BIM.”)

Back to Level 2 BIM: If this is a UK phenomenon, why should readers of this journal care?

Reason No. 1: If BIM is the future of design, it is a GLOBAL future. So we need to keep an eye on global trends, especially where they are leading thought. An example: One of the world’s most expensive and innovative buildings—the new Apple headquarters in Cupertino, is being designed by UK-based Foster + Partners. The structural engineer is ARUP (UK and US). Shop drawing detailing for the structure is being done in Manila by a firm based in Perth, Australia.

The steel will almost certainly be manufactured – and probably fabricated – in China. The BIM system for those shop drawings is a completely proprietary product, designed and built by the firm using it – and my recent tour of it in Manila suggests it is the equal or better (at least for structures) of any of the big names in parametric modelling.

Reason No. 2: With the UK government pushing hard on designers to left their skills, they are beginning to think about the long-term consequences of rising to the challenge. Adrian Malone, a Director of Faithful & Gould and frequent contributor to UK BIM discussions on BIM, argues that BIM will necessarily—and significantly—change the way we manage projects. Malone notes that there is huge resistance to such change.

Ike Ijeh, writing inBuilding magazine (Building.co.uk) quotes Russell Curtis of the design firm RCK: “BIM has the potential to be hugely empowering for architects and it can give us the opportunity to regain some of the ground that has been lost to other areas of the industry.”

To put this into perspective, consider the enormous complexity of design today. We’ve spent the last half-century deconstructing design practice, breaking it down into scores of discrete professional niches. I believe this is a natural consequence of the exponential growth of information coupled with aversion to risk. (I can’t complete this thought in this article; it’s worth a full book.)

Putting this Humpty-Dumpty back together will be fiendishly difficult. Yet, taking command of the interstices between separate design disciplines is crucial to the regaining of influence that Curtis notes. Failure to do so will result in increased marginalization and irrelevance. To contemplate the complexity of the task ahead, study the UK government’s model for Level 2 BIM, below. A no-brainer, right?

Charles Nelson, AIA, LFRAIA, is the Director of PSMJ’s Australasia practice. He is also known for writing and speaking extensively on project and practice management. Charles can be reached at cnelson@psmj.com.
PSMJ’S RESEARCH GROUP IS GEARING UP FOR THE 2015 SURVEY SEASON!

Be sure to participate in this year’s surveys and receive a $200 discount on our final Survey Reports, along with a complimentary PSMJ Personalized© Benchmark Tool, customized just for you. The easy-to-use, Excel-based tool puts key metrics at your fingertips with a click of your mouse. Here’s a sneak peek of what’s in store for our 2015 Surveys.

Be on the lookout for invitations to participate in this year’s Survey Program from PSMJ’s Research Group, beginning December 3rd. Please opt in to our Surveys Email list at www.psmj.com/surveys-research/survey-opt-in.cfm and we’ll make sure you receive the questionnaire links.

Questionnaires are also available for download from our web site. See our participation page for details on our fantastic participant perks, along with downloads of our free benchmarking webinars: www.psmj.com/surveys-research/participation.cfm

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Submit your financial data online at www.psmj.com. We won’t be officially announcing survey deadline extensions this year, but please be sure to contact us if you need more time.

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THE CUTTING EDGE OF BIM by Charles Nelson, AIA, LFRAIA

Where’s the hot action on BIM right now? My (admittedly incomplete) research suggests it is two places: The UK, and Manchester, NH. It’s shifted from only a few years ago.

The US General Services Administration (GSA) was an earlier adopter of BIM logic and the 900-pound gorilla in the BIM forest. GSA appears to have lost momentum in the BIM movement. Go to the GSA BIM Library (http://www.gsa.gov/portal/content/103735) and you’ll see that the latest documents on file are 2012 or earlier, and most go back to 2006-2007.

The American Institute of Architects (AIA) has long taken a high profile in BIM matters – I counted over 200 BIM-related documents available for download on the AIA website. Maybe this is over-simplification, but my impression was that most of these are articles by practitioners on their experiences, typically dealing with specific BIM aspects.

If there is any over-arching, current AIA policy statement on BIM, I missed it. Given that BIM is widely heralded as the hands-down winner in the future of architectural practice, I found that to be a serious omission. (If it’s there, and I didn’t find it, somebody please let me know.)

The AIA has a number of “grass-roots” organizations called Communities of Practice. The Technology in Architectural Practice (TAP) is the one that champions BIM. For the last decade, TAP has had an awards program honoring firms that demonstrate BIM excellence. As of 2015, TAP is moving its focus toward firms working in 6D BIM: (http://network.aia.org/technologyinarchitecturalpractice/home/buildinginformationmodelingawardsprogram)

TAP has been instrumental in keeping up the drumbeat for “interoperability,” which means that BIM tools and their suppliers need to support non-proprietary, open-format exchange protocols. In 2012 TAP published Position Statement on BIM Technology and Interoperability, about as close to a manifesto as the AIA gets. It includes a useful glossary of acronyms abundant in BIMspeak: http://network.aia.org/technologyinarchitecturalpractice/home/bimstandards

The international umbrella group for BIMmers is the international coalition BuildingSMART (http://bimguides.vtreeem.com/bin/view/BIMGuides/Guidelines).

BuildingSMART has an extensive library of articles: http://bimguides.vtreeem.com/bin/view/BIMGuides/Guidelines#Information.

There is a National BIM Standard in the US (http://www.nationalbimstandard.org); part of the Building SMART alliance. See http://www.nationalbimstandard.org/about.php for more information and how to participate in this organization’s work.

So—why the UK and Manchester, NH? UK first: as discussed in another article in this issue, the UK government is pushing its designers hard, requiring Level 2 BIM by 2016. The pressure is on, forcing UK architects and engineers to deal NOW with the not-so-easy requirements of future BIM.

And why Manchester, NH? Because that’s the home base of Newforma, arguably the most forward thinking commercial player in the BIM movement at the moment. HUH? But isn’t Newforma a Project Center software provider? They are — but Newforma has coined a new acronym: PIM, for Project Information Management. And Newforma is integrating BIM information with Autodesk’s Revit.


Charles Nelson, AIA, LFRAIA, is the Director of PSMJ’s Australasia practice. He is also known for writing and speaking extensively on project and practice management. Charles can be reached at cnelson@psmj.com.

SAY HELLO TO BY-BYS by Lauren K. Terry

Fourteen-year A/E/C industry expert and PSMJ Project Management Bootcamp instructor, Bill Hinsley, has a recommendation for you: add “by-bys” to every meeting you lead, attend, or, heck, even walk by.

What’s a “by-by”? It’s a simple strategy in which you verbalize—at both the beginning and ending of a meeting—the “By Who” and “By When” action steps that need to be taken (or have already been taken) on a project.

This jiffy-quick method helps to ensure the project (and your people) are staying on track. The purpose of the “By Who – By When” tactic is not to assign blame or put anybody on the spot—chances are, several of the action items will have a report of “no progress,” and that’s OK. The point is to get everybody on the same page, remind everyone of what needs to be done, acknowledge progress that has been made, and slowly make progress on action steps so that your project can be completed on time and on budget.

You want to be really fancy? Next time you’re reading off the by-bys, do them in order of what’s most pressing to the project—that way, your people can re-prioritize their to-do lists at every meeting and you get the chance to reinforce your priorities without hitting people over the head with them. ●
**Flux is going to Shock the A/E Industry**

Flux, a spinoff of Google X with billions of dollars in funding, is going to change everything you know about how buildings are designed and constructed, and will make BIM look as exciting as a fax machine. Combining reams of data, building requirements, and algorithms, Flux is intended to help architects, developers, and contractors efficiently collaborate in the creation and construction of buildings that are not only sustainable, but also intensely site-specific.

The concept is to create building as Mother Nature would, with an assumption that each building has its own uniquely coded DNA, and starts the design process as a seed. Google’s hope is to address the urban population crisis by creating buildings that are perfect for the exact location and use, based on data, and that can adapt over time.

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**PSMJ GoNoGo** is PSMJ’s all-new web-based tool and mobile app that brings simplicity and clarity to your go/no-go decisions. If you decide to go, this app gives you great guidance on what you need to do to increase your chances of winning. And you can store and email the results of each use. It’s fast, easy to use and, best of all, it is absolutely free. Visit the Tools section of our Knowledge Community at www.psmj.com to get started. Android users can also get it from the Google Play app store.

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**DO YOU HAVE PURPOSE?**

In my spare time, I serve as board president of a non-profit theatre company I co-founded back in 2007. One of our producers, Meg, is passionate, creative, and highly competent. She initiates and accomplishes tasks for their own sake because she finds them interesting and satisfying.

Though she enjoys the short-term gains of extrinsic motivation—like money, status, and recognition—she thrives more fully on the gratification she receives from internal factors such as the ability to work autonomously, to improve incrementally, and to see progress plainly. She’s powerful because her motivators are powerful.

Meg’s biggest motivator is the idea that she makes a difference—that her work has purpose. Having purpose in your work is when you feel your efforts and accomplishments have meaning. You need this sense of purpose to kick in on a daily basis, especially when you’re dealing with menial tasks. Out of all the intrinsic motivators, purpose is arguably the most impactful.

So … do you have purpose in your work as a project manager?

If you’re struggling with that answer, here’s a 20-minute exercise to help. First, ask yourself these four questions, developed by Jan Bruce, to help you define your purpose and meaning at work:

1) **How do you define success?**
2) **How does your family inspire you?**
3) **What are your hopes for your community?**
4) **When do you feel most aligned with your core values?**

**Minutes 0-8**: Set a clock for two minutes and answer each question by writing or typing out your answer.

**Minute 9**: When you’re done, spend a minute reading over all of your answers at once.

**Minutes 10-14**: With this next five minutes, spend some time thinking about how you can connect each of your answers to what you do at work.

**Minute 15-20**: Create a brainstorm outline based on your job, the answers you provided in the first part of the exercise, and the connections you made between each. For example, here’s what Meg’s brainstorm outline might look like:

When you’ve completed the brainstorm outline, pin it up in your office so you can look at it on the days that seem most encumbered by the mundane. By reminding yourself of why you do what you do, you’ll be able to do it better.

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**WRITE FOR PSMJ**

Do you have some new, innovative project management tips to share with others? Do you have interesting stories about your project management successes and failures? PSMJ is looking for great writers and stories for *Project Management*!

Writing for PSMJ is a remarkable opportunity to enhance your authority, add to your professional resume, bring name recognition to your company, and see your name and contact info in print in a prestigious and highly regarded journal.

If you’re interested in writing for us or have a story idea for an upcoming issue, please write to Lauren Terry, PSMJ’s Managing Editor, at lterry@psmj.com.
1. According to PSMJ, historically PMs have delivered projects using a three-step method that includes the following:
   a. Defining the need
   b. Designing the project
   c. “Selling” the project
   d. All of the above

2. Who wrote “The Death of Drawing”?
   a. David Ross Scheer
   b. Michael Ellegood
   c. Charles Nelson
   d. David Whitemyer

3. What is “Todoist”?
   a. A phone app that organizes news
   b. A free to-do list phone app
   c. A phone app that outlines project schedules and agendas
   d. None of the above

4. According to PMI, project managers are how much more successful when their parent organization provides ongoing PM training?
   a. 5%
   b. 18%
   c. 12%
   d. 8%

5. According to Russell Curtis, of the design firm RCK, BIM has the potential:
   a. To be hugely empowering for architects
   b. To destroy the A/E industry
   c. To give us the opportunity to regain some of the ground that has been lost in the industry
   d. A & C, but not B

6. According to DesignIntelligence, what is the average amount of A/E projects that don’t meet either their original schedule or budget?
   a. 40%
   b. 30%
   c. 50%
   d. 25%

7. What is RIBA?
   a. Royal Institute of British Architects
   b. Really Interesting Books on Architecture
   c. A well-known red-headed country singer
   d. None of the above

8. According to PSMJ, where is the “hot action” of BIM right now?
   a. The UK
   b. Manchester, NH
   c. Newton, MA
   d. A and B, but not C

9. Flux is a spinoff of … ?
   a. Google X
   b. Gchat
   c. Google Chrome
   d. Internet Explorer

10. According to PSMJ, what is arguably one of the most impactful aspects of intrinsic motivation?
    a. Improvement
    b. Autonomy
    c. Purpose
    d. None of the above

REQUIRED CONTACT INFORMATION:

Full Name ________________________________
Title ________________________________
Firm Name ________________________________
Firm Address ________________________________
E-mail Address ________________________________
AIA # ________________________________
Signature ________________________________
Date of Submission ________________________________

By signing and submitting this form, you certify that you have read the corresponding issue of Project Management and have completed the above test.