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Getting the Most from New Software Technology

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Have you ever said to yourself, “We pay for modern software tools, CAD managers, IT, hardware, implementation, and training, but I can’t help feeling we aren’t getting all the productivity we should have.”? In my experience, most senior management staffs have thought this at some point—but why? In this class, we’ll explore the role senior management can play in making new tools perform through motivation, CAD management intervention, implementing mission goals, customer interaction, and expectation management. Along the way, we’ll explore the key failure modes that impede technology productivity that CAD managers and users often miss. These include poor user psychology, contractual barriers, negative peer pressure, and lack of mission focus. Make no mistake, senior management really does have a role in rolling out new software technology, and this session will help you understand that role better so you can get the most from your software environment.

About the Speaker

Robert is head of the Robert Green Consulting Group, and a 17 year veteran speaker at Autodesk University. You have likely read his work in Cadalyst magazine, where he authors the "CAD Manager" column, or in his bi-monthly CAD Manager's Newsletter. He holds a degree in mechanical engineering from the Georgia Institute of Technology, and gained his CAD skills from 25 years of AutoCAD®, MicroStation®, and MCAD software usage. Since starting his own company in 1991, Robert has performed consulting and teaching duties for private clients throughout the United States and Canada.

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Foreword

I've heard senior management staffs make the following complaints since AutoCAD first started displacing the drafting board in the mid 1980's:

- We've spent all this money on software but we aren't executing projects any better.
- It takes us way too long to get new software implemented.
- Many on our staff are dragging their feet on using new software technology.
- We just aren't getting the productivity we thought we would.

Now, to be fair, complaints these days are about BIM or other 3D CAD issues instead of AutoCAD but even with radically different technology the complaints remain largely the same.

In this class I hope to provide some guidance and inspiration for senior managers who want to get involved with new software implementation so that optimal productivity gains can be achieved.

Initial Realizations

When confronted with the complaints I outlined above I'll frequently ask management staffs the following diagnostic questions:

- What did you think would happen in terms of software implementation?
- How easy did you think the transition would be?
- Did you help spearhead the new software's implementation?
- Did you assume the CAD manager would simply "handle" the implementation?
- Did you take into account how software would impact customers? Project teams?

Using these questions to open a conversational dialog leads to the following conclusions:

- New software is harder to implement than you think.
- New software requires more time to win users over than you think.
- New software requires senior management involvement to really work.
- Customer and project management team's involvement is critical.
- CAD managers waging the new software battle need senior management backup.

Have you had these discussions in your company? With your CAD manager? With your users? With your customers? If not, why not?

Conclusion #1: ***New software implementation doesn't just happen, it happens as a result of managing the transition with all interested parties with senior management acting as referee.***

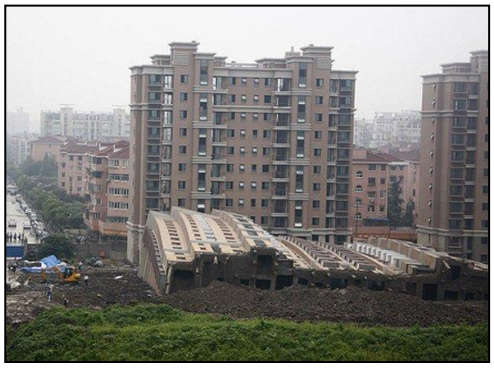
Surprise: Tools ≠ Results

I've heard it from so many management staffs – "Once we start doing our designs on BIM all our problems will go away." Wow, where can I begin to debunk this myth.

First, just because your company has the latest software tools doesn't mean you're using them well or can use them well when you start. Some projects end in failure even though they use modern design tools (see right) while some projects endure (see below) even though they were created with primitive tools.

An Example: Failure

Lotus Riverside Complex
Shanghai
June 27, 2009
Modern tools, modern techniques, old fashioned failure!
Do great tools really guarantee great results?



An Example: Success
The Sphinx and Great Pyramid
Giza, Egypt
c. 2540 BC
Primitive tools, unknown techniques, enduring quality!
Can great methods overcome poor tools?

Of course my examples don't state certain truisms like "we could build the Sphinx a lot faster now than they could then" or "we could build the Sphinx with far fewer people now." However, I would point out that the Sphinx is so well designed, fitted and built that it has experienced no significant foundation shifting and despite 4500 years of sand blasting and erosion has withstood the test of time. Conversely the collapsed building had all the modern tools and methods but good old fashioned design error caused a failure.

My point? CAD tools or BIM don't guarantee success, good design and management combined with great tools guarantees success. It is when you combine great CAD tools and management with great design that you really achieve a winning project.

Conclusion #2: ***If you think new software will fix your problems and make everything better you're overvaluing the tool and undervaluing the process of managing the tools.***

Defining a Technology Mission

What does all this mean for CAD/technology management? Good question.

Have you ever noticed that people respond much better to challenge than ultimatum? Ever notice that people achieve more when you give them something complicated to do and appeal to their sense of worth and collective will to achieve? Ever notice how poorly people do when you give them something to do that they have no vested interest in?

All these scenarios illustrate the profound power of defining a mission for your staff to achieve rather than something for your staff to learn. Here are a few examples of ways you can make your new software a mission rather than a chore:

Don't say:	We're going to implement Civil 3D
Do say:	We're going to be the fastest, most cost effective, most client responsive Civil Engineering firm in our city/state which may mean we've got to leverage new tools like Civil 3D.
Don't say:	We've got to go to BIM
Do say:	To meet client demands and contract requirements we've got to figure out how to make BIM work for us.
Don't say:	Well we've implemented Inventor so we're all good now.
Do say:	Now that we've figured out how to execute a project with Inventor we need to see how we can leverage that to make the next project go quicker, smoother and more profitably.

Notice how the mission is to achieve a client goal or business objective NOT to learn a piece of software. Notice how the mission has challenging language using terms like "learn" or "leverage" or "figure out" so your staff understands that they must be actively involved in the process and that the process will NOT be an easy – just like last time – experience.

To summarize:

- Mission = Challenge
- Challenge drives tool selection
- Tools require learning
- Learning means constant change
- Constant change makes things incrementally better

Conclusion #3: Give users a mission to achieve not a piece of software to learn.

Let the Mission Define Tool Usage

Another reason not to worship a specific CAD tool or specific software work methods because the mission parameters you work to may dictate how you use the tools. In fact, you may have to use software in ways you never imagined to get your project done. Consider the following scenarios:

Apollo Saturn V
NASA, USA
1967-1973
Guidance computer had 38K ROM and 2K of RAM
Clock frequency of 0.0000002 GHz
The team created the technology to carry out the mission

Android Phone
Samsung Ltd, South Korea
2010
32 GB storage, 1 GB RAM, dual core processor operating at 1.2 GHz
Great technology but is posting to Facebook a mission to get excited about?

The Apollo example points out that work teams can be profoundly challenged when given a mission that requires them to innovate and make available tools work to accomplish the mission. The smart phone example makes the point that you can give your staff great tools but if there's no sense of mission they won't much care.

So if you want to get your staff excited about using 3D modeling, BIM, or any other new software technology how do you define the mission? Consider the following aspects that all CAD based projects share:

Client defined deliverables. When the client specifies the information format and version you have to comply. This parameter dictates CAD tools or, at minimum, what we must be able to convert our work product to.

Long duration projects. When a project spans multiple years we often wind up using old versions of CAD tools simply to make collaboration and file control easier over the project's duration. It is hard enough doing the job without a software migration in the middle of everything else!

User knowledge base and/or costs. You may want to design that brand new skyscraper project in BIM but if everybody in the company is using AutoCAD LT you won't be able to afford the BIM software and training you'd need on one job. And even if you could afford it you'd never meet the schedule given the training requirements.

Time constraints. Speaking of training requirements, have you ever been involved with a project where new software tools caused the schedule to fall behind? I have and I can tell you that management's first response will be "go back to the old system" all while blaming the CAD manager for the failure. Don't allow yourself to fail because you were too busy thinking about tools and forgot the design mission at hand.

The more I implement new software the more I come to understand that the realities of client demands, current staff expertise and tool adaptability dictate the pace the new tools can be implemented. After all, getting the project done is all the client cares about – not what tool you use.

Conclusion #4: ***As goes the project, so goes the implementation of the tools.***

Technology Accelerators

Now don't get me wrong, I like modern CAD tools and would prefer to use them over pencil and paper any day of the week, but CAD tools don't make me a better engineer unless they allow me to do my work faster with as good as (or better) quality than the prior generation of tools. Or in the parlance of Jim Collins in his excellent book Good to Great, I view CAD tools as technology accelerators that allow me to do my design work faster. On the other hand, I've seen many companies switch away from tools that already work to new tools (that don't work for them) and those CAD tools function as a technology anchor, slowing down the design process.

So how should we evaluate CAD tools to know if they actually accelerate design or just waste our time? The following metrics do a great job of qualifying accelerator type tools:

Do adopt technologies that:

- Are robust enough to work under production pressure
- Cut man hours for known tasks
- Enforce standardization without user intervention
- Provide a work product that customers will pay for
- Support marketing efforts so the company gets more work
- Be aware, you may have to integrate to achieve the mission

Don't consider a technology

- Just because a vendor tells you to
- Because it is cool or the "it" application right now
- If you don't have the expertise to manage it
- If it would "undo" more than it "does"
- Be aware that "off the shelf" is never "mission specific"

When considering new technology you must always look for the upside yet acknowledge the possible downside. And remember that if the technology isn't accelerating your ability to complete projects then there is no business purpose for adopting it.

Conclusion #5: ***No matter what tool you implement, make sure you emphasize the tool attributes that allow it to function as an accelerator while bypassing the attributes that could slow you down.***

Expectations: There's no "Easy" Button!

Most new software we implement these days encompasses a 2D to 3D process change. I like to call it "take away their AutoCADand see who screams" because that is essentially how the process is managed.

Now it seems obvious to me that there is no "easy button" that will make replacing AutoCAD with 3D and/or BIM modeling technology but that doesn't seem to be the case when reading marketing literature does it? Marketing literature uses words like "easy" or "simple" or, my personal favorite, "intuitive." I've been working with 3D CAD software implementations since 1986 using SDRC Ideas, CALMA, Pro-E, Solidworks, Mechanical Desktop and Inventor and I can confidently say it has never been as easy as the marketing guys would have you believe.

Over the years I've developed some guiding principles that senior management teams must understand in order to have new software implementation run smoothly and thus deliver maximum value in minimal time:

It won't be easy. If senior management has an unrealistic expectation of how easy, fast and cheap it'll be to implement new software even the best CAD manager can never live up to these expectations.

Lack of backup. The best CAD manager in the world can never implement new software if their management doesn't back them up, fund them and give them the time to succeed.

IT issues. The best implemented software in the world will never be accepted if the hardware and/or network systems of the company aren't up to the task of running it.

User acceptance. The greatest software in the world can never be implemented if users aren't ready to make the changes needed to use it.

Enforcement IS required. No matter what you do, renegade users can always torpedo your new software implementation. Since CAD managers aren't usually empowered to discipline these users it becomes critical that senior management will.

The Expectations Game

What all my truisms have in common is a component of expectation. By this I mean that everyone comes into the software implementation process with an idea, right or wrong, of how things will go. Some users will have expectations of a negative experience that will require a lot of change on their part. Many times management teams will expect implementation to be easier, faster and cheaper than it really will be. And in some cases IT departments will underestimate how much more taxing 3D applications can be on hardware and network infrastructures.

If you combine all these improper expectations you can see that nobody is going to be happy when the reality of 3D implementation sets in. And if nobody's expectations are met then the software implementation WILL fail even if you do everything right!

Preparation: Adjust the Expectations to Win

As I've made my way through various sofware implementations I've come to believe that adjusting everyone's expectations ***before*** implementation happens is critical for success. Only when things go as expected are people happy and the only way for that to happen is to inform, educate and articulate how things will go as early as possible.

Of course, the CAD manager only has so much ability to set expectations so that's where senior management comes into play. So how do you manage expectations? Let's look at a checklist I use that always helps me achieve control:

Talk to your CAD manager: Discuss user expectations, staffing, budgets, etc. Your job is to draw information from the CAD manager to help you understand where the implementation problems will be. You may be surprised how many things the CAD manager is worried about that you'd never think of.

Understand IT needs: If the expectation is that you'll go from AutoCAD 2004 to Revit, Inventor or Solidworks on a 3 year old single processor machines with 1 Gig of RAM you're going to have some unhappy users. Now is the time to get a plan in place for new hardware (dual processor with 4 Gig RAM minimum) because you know it'll take longer than you think to get the new hardware approved. Your CAD manager can help you with this process.

Do user acceptance testing: To make sure you'll have a critical base of users that will actually want to learn the new 3D tools you'll need to expose them to the new software and collect their feedback. Have your CAD manager take some trusted power

users to a vendor seminar or load up new software on some laptops and go into a conference room for mini training sessions. The point is to get users enthused about learning and get their honest feedback before the implementation occurs – this step is CRUCIAL!

Be ready for unhappy users: As your CAD manager performs user acceptance testing you'll no doubt encounter those who don't like the new software. Note their reasons for not liking the software and note who has the most negative attitudes so you can modify your implementation plan to avoid problems.

Regroup with your CAD manager: You should now have user and IT expectations adjusted to reality so it is time to talk about realistic time frames for training, IT purchases, and user acceptance. You and your CAD manager should now have some consensus on how the process will go and what preparation steps will be required.

This multi-step process has really helped me to build trust with users, IT departments, senior management and CAD management staffs at a variety of companies. The key aspect to the process is that all parties confront reality and adjust their expectations accordingly. Try it, it really does work!

Conclusion #6: ***Proper Prior Planning Prevents Poor Performance.***

Starting Anew: The Pilot Project

Implementing a new piece of software for the first time is like shaking down a new aircraft. You never know what you might experience so you'll need to have a great team to help. Recruit your team for success and call them "test pilots" to convey status and recognition of their skill sets. Remember to get these types of pilots:

- Self learners
- Those who value new knowledge
- Those who see a career benefit
- Those who will work through unknowns

The Test Pilot Team

So what sort of CAD technology team will you need to accomplish the mission? Will team members need to have specific skills or should they be learners and innovators who can easily acquire specific skills? What are the attributes of a good team member?

To start our discussion let's talk about who you DO NOT want on your CAD team:

- Those who always defend the status quo
- Those who always rail against the status quo
- Those who refuse to learn new CAD skills
- Those who expect to be spoon fed training
- Those who refuse to modify their methods
- Those who freak out under deadline pressure

If they want to be on the CAD team yet they exhibit the characteristics above then you need to be honest and tell the person what your selection criteria so they have a chance to better themselves.
Here's who you do want on your CAD team:

- Those who are committed to success
- Those who can learn and expand their skills
- Those who will self learn due to curiosity
- Those who can adapt to new situations
- Those who thrive under stress or pressure

This team is ideally suited to being a core member of your CAD innovation team because they want to be there, they won't take too much of your time, they are independent learners and they actually want a challenge. No matter how your mission twists and turns and no matter what sort of tools and techniques you have to adopt to accomplish your mission these are the people who can help you!

Conclusion #7: ***A great team makes the mission possible, but a great mission doesn't guarantee a great team. Senior management is better able to control the team than any other aspect so pay close attention to team membership.***

Instilling Discipline

By discipline we mean making sure that great things continue to happen not an authoritarian concept of discipline. Remember that discipline is an entirely different thing when you are dealing with people who tend to discipline themselves – and those are the people you've strived to get on your team in the first place, right?

In this context discipline is really about the following:

- Keeping team members "on mission"
- Keeping team members focused on improvement
- Coordinating pilot projects and new tool/method adoption
- Making sure project milestones are met

If you plan for great, expect great, do pilot projects to achieve great and manage in a way that rewards great discipline starts to just happen. Your challenge is to function as the Level 5 Leader that maintains a sharp focus on great so no backsliding into good creeps into the organization.

Conclusion #8: If you let rouge team members ruin the mission you've got nobody to blame but yourself.

Senior Management for the Win

As the adoption of new technology takes root in your organization always remind yourself of the following truths and make sure your CAD team is reminded of them as well:

- There is no Easy Button!
- This doesn't just happen
- This requires effort
- This requires senior management support
- This will save you money
- This will make customers happier
- This will bring us more opportunity

As you have the conversation about new software technologies in your organization stress the business results that great will bring and downplay the technology. When technology does come up have the conversation about the CAD team you've built and how you're using technology to accelerate the business needs of the organization.

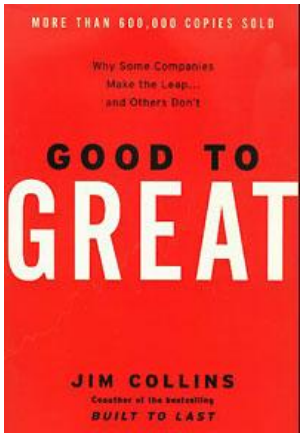
Persistence: Keeping at It!

Big things can happen when you apply a consistent force over time. Implementing new software is the same in that it requires a constant commitment to making it work better to accelerate your business.

So don't say: We're done implementing BIM now.

Say this: Let's enjoy our success for the moment, but what is the next challenge?

Recommended Reading



Good to Great:
Why Some Companies Make the Leap... and Others Don't
by Jim Collins

I can't recommend this book highly enough. Even though it isn't a technologist's book per se there is so much valuable insight into managing an organization that I've found it very compelling.

Updated Materials and PowerPoints

You can download updated materials (with any additional notes, corrections or supporting files) for this presentation at the AU web site using your AU user name and password. I will also post course summaries at my web site at this URL: www.CAD-Manager.com/au2012

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