The CAD Manager's Training and Standards Guide

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Are you responsible for training your CAD users but feel overwhelmed by the task? Are you stymied by the problems associated with enforcing CAD standards? In this session, we'll cover some strategies for combining standards enforcement with an in-house training program to solve both problems simultaneously. We'll start by building your company training program, creating effective training materials, and ensuring that instructional delivery results in productive users. We'll also look at controlling overhead and motivating users with ongoing education to reduce Help Desk questions. Special attention will be paid to coordinating your training program with other efforts like CAD standards and quality-management programs. If you're responsible for creating a training program and/or the delivery of that program, you can't afford to miss this session!

About the Speaker:

Robert is head of the Robert Green Consulting Group and a 13-year veteran speaker at Autodesk University. You've 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 21 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 and throughout the U.S. and Canada.

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1. Surprise — You Set the Agenda

Whenever I speak to a group of CAD managers, the topic of staff training and development invariably comes up. It seems that most CAD managers are expected to function as a corporate CAD training department while also keeping their CAD departments running. Although the expectation of keeping CAD users trained has remained on the CAD manager's plate, the funding and resources to do so have been reduced noticeably.

I first noticed the trend toward declining training resources during the recessionary period from 2001 to 2003 and, in down markets, could understand the trend. However, current upward business trends and software upgrading have been accompanied by recession-level training budgets. It seems that the days of formal training programs are gone, leaving the CAD manager to reinvent corporate CAD training. This month I'll pass along some approaches and procedures I've found of use in my own training work. I hope you'll find some ideas you can use.

First, Sell the Concept

Before you can conduct a training program, you'll need to convince your management that training people is a worthwhile endeavor. When you consider that training not only costs money to deliver, but also causes a drop in productivity while people sit in class, you can begin to see management's viewpoint. In order to get your management on board, assure them that you'll do the following:

- Target the training to increase user productivity

- Keep the time demands on users to a minimum

- Use training to increase acceptance of standards

All these objectives demonstrate that you'll tailor a training program to maximize results and minimize expenses, thus creating maximum value for your company. In short, if management believes you'll deliver maximum "bang for the buck" with your training program, they'll be much more likely to support you. I can't stress enough that getting management support is crucial in order to maintain a long-term training program.

Find the Topics

Once you've received support for a training program, you need to develop your list of training objectives and prioritize them. So how do you know what topics to train users on, and how do you prioritize those topics?

The first place to look for training topics is in your email inbox. Search through your list of emails and take the time to identify what sorts of questions you're being asked. If the number-one user question you receive is how to use your company's XREF standards, then a tutorial on the proper use of XREFs should be the very first training class you run. If the next most popular question is how to access a particular plotting device, that tells you what your second training class should be. Analyzing your training needs based on questions from users is really a blessing in disguise because you're taking the time to see what actually confuses your users, which in turn should give you keen insight on how to improve your procedures and standards as you train.

You'll most likely notice that the training topics you'll compile will have a close correlation to how people work with CAD tools in your specific environment. The question won't be, "What is an XREF?" but rather, "How do I use XREFs on a given project to meet our CAD standards?" Please note the distinction between these two questions and that users don't typically blame a command for being confusing (the XREF command in this case), but they'll be happy to blame CAD standards or procedures! Your training challenge becomes teaching people how to use CAD tools in your particular environment rather than a generic usage of a given set of commands.

Include Standards When You Train

Whenever you perform any sort of training, you can best emphasize concepts by relating examples in your training program to their use in your actual operating environment. One powerful way to do this is to demonstrate your use of standards in all training exercises. Here are a few examples you can use:

- If you're showing users how to properly attach, scale and XCLIP an external reference in AutoCAD, make note of your company standards and use an actual XREF that users would see in their daily routine.

- If you have custom programs in your CAD environment that staff can use to set up standards, demonstrate those frequently in training exercises.

- If you invoke standards via startup files or automated configurations, point them out at the beginning of your training exercises.

- In all cases take a few minutes to explain why standards are important, and solicit user questions on standards.

The end result should be that users learn the right way to do things (via standards), why it is important to do things the right way and how you're helping them. You may find that a conversation about standards will start to happen between you and your users, allowing you to tap into their expertise and debug your own standards. More on that in the next section.

Fix Processes/Standards if Required

If your list of training topics or classroom experience seems to indicate that inability to comprehend standards is the number-one cause of confusion in your company, it may be time to examine your standards. Bottom line: If it is hard for you to train people on how to use a feature, imagine how hard it will be for users to learn it.

You may find that embarking on a training program will give you a great opportunity to update and tweak company standards and procedures. Since your training program is supposed to raise user productivity and cause minimal intrusion on work schedules, everyone involved should support your desire to simplify work processes via training.

2. Build Your Own Training Materials

Running a training class without training materials is, in my experience, a waste of time. Since most people don't take good notes during a class, it becomes the instructor's responsibility to provide a handout or workbook that chronicles the training. After all, as soon as people walk out of a training class, the only resources they have to fall back on are their memory and the handouts you provide.

Since I've advocated targeted training that solves your company's specific problems, it is obvious that you can't go to Border's Books and buy a training workbook for your company, right? That means that you'll have to create your own training materials. Before you panic I'll give you some suggestions for creating quality handout materials in an easy manner. You don't need anything other than your CAD application and a good word processing tool to build your own training materials. Here's how:

> **First.** Purchase some software tools to help compile, record and publish your training materials. I've listed my favorite software tools, Camtasia and SnagIt in Table 1.
>
> **Second.** Conceptualize what you'll be teaching and then come up with some example files you can use to illustrate/demonstrate the concept. Don't worry about anything polished at this point; just make sure you can convey the information to your students with the example files you've created.
>
> **Third.** Now turn on Camtasia, put on your headset microphone, and run through your lesson just as if you were running a training class. If you flub up, don't worry; just keep going as if you were in a real class. I recommend taking a laptop into a conference room or working at home so you won't have to deal with phone interruptions while recording your lessons. When you have finished, close out your Camtasia session and save the file so you can find it later.
>
> **Fourth.** Using your recorded presentation as a guide, open your word processor and work through your lesson, recording your text and capturing graphics into the open document. Don't forget to save often! Don't worry about spelling or polished formatting; just get the content into your text document.
>
> **Fifth.** Finish your handout by spell checking, adjusting syntax and formatting your document to make it look good. Do several printouts and keep adjusting the handout until you're happy with it. Congratulations — you're done!

As you create training materials, always strive for concise wording, illustrative screen captures and clean layout as the most important attributes. After all, if your materials are easy to read and visually rich, people will look forward to attending your training!

3. Deliver the Training

Now that you know what you are teaching and you have your materials, simply deploy your training program using either instructor-led training sessions or informal meetings like lunch-and-learn sessions. In any case, I recommend the following steps to make your training sessions go smoothly:

Use a projector. I've learned it's impossible to train without some way to demonstrate what you're teaching, and projectors work the best.

Have your handouts ready. Don't start training until you have the materials copied, bound and ready.

Insist on timeliness. Set a starting time and stick to it. Late arrivers should be expected to make up for lost time on their own. Set the tone that training is valuable and so is your time as the instructor.

Have a sign-in sheet. This sheet documents who was there and who wasn't. It also makes it easy to spot those who say they want training but don't show up for it. You'll also be able to demonstrate to your management that people are coming to your training sessions.

Record what you do. If training is worth doing it is worth recording for later use. This may require you do purchase a wireless microphone, but the payoff is training on demand by simply replaying video recordings.

Do a wrap-up write-up. After your training is complete, summarize how it all went and forward a copy to your manager. This is a small bit of self-promotion that you need to do so that your management knows what you've accomplished.

If you've done all the hard work to prepare your training topic list, materials and additional resources, don't scrimp on the delivery! Use the tips above to get consistently good, reusable training results.

A few extra ideas you may wish to consider:

- Use lunch-and-learn time slots to deliver "bite sized" training to a wide audience.
- Catalog all your recorded videos to make your own training videos.
- Use these methodologies to create training for your standards and procedures, and you'll end up with a video standards guide.

4. Using Stock Materials

You may be able to use some stock training materials for software updates. Here are some stock resources I've found useful over the years.

Published books. These are typically soft-cover, bound books that address a broad spectrum of topics and cost about $20 to $50 per copy. The advantage of these materials is that they cover a lot of ground, but the disadvantage is that they aren't geared toward classroom training environments. You'll find a listing of AutoCAD books at Amazon.com (along with customer reviews to help you decide which one is right for your needs), and you should also check out the Autodesk AOTC Courseware titles at Autodesk.com.

Video captures. In cases in which you'd like to show your users how to do something, you can create your own computer video captures much easier than you may think. The clear advantage to video capture is that it can be placed on your network so users can replay it whenever they want at no additional cost. You could even use this utility to capture entire training sessions for replay later. I've used a software utility called Camtasia and its associated audio editor called DubIt with great success to create audio/video files that can be played using Windows Media Player.

Computer-based training resources. Companies like 4D Technologies (www.4dtechnologies.net) allow you to educate users with DVD lessons that are well indexed so users can skip through the various lessons to learn just the skills they want. These types of resources are outstanding for motivated learners who'll take the time to self-teach.

Live Internet-based training. Commercial web-based training is gathering steam but isn't yet ready to fill the corporate training void, in my opinion. The problems associated with web-based training are that users have to participate in the training when it is presented and that it charges a per-use fee.

The key conclusion I'd like to point out is that a wide variety of materials are available in a range of media delivery formats so you can employ a broad-based strategy for user training. Most companies have a mixture of users who will respond better to a variety of information formats, so you may need to experiment a bit to find the mix that works for you.

5. Establish a training library

Of course if you're going to create snazzy training materials and recorded training sessions, you should put those resources to work for your department full time. By creating an organized library of materials you'll make it easy for users to look things up for themselves, and you'll be amazed at how much a training library helps in training new employees. Think of the training library as a result of your efforts that will continue to pay back long after your training sessions are over.

Incidentally, the concept of an employee training library typically plays very well with project managers and technical management. If you can make the case for bringing new employees into your CAD standards environment with a smooth transition, watch management line up to support you.

I've found a few useful hints for deploying training libraries:

First. If you publish handouts for your training sessions, organize them in a standard directory and link to those files from your CAD program's toolbars.

> Here's an example of making an AutoCAD popdown menu deploy a link to an Acrobat file and an HTML file as well:
>
> ***POP11
>
> **HELP
>
> ID_MnHelp   [&Help]
>
> ID_Help   [&Help\tF1]'_help
>
> [--]
>
> [Call Acrobat]^c^c^p(startapp "C:/Program Files/Adobe/Acrobat 6.0/Reader/acrord32.exe" "n:/training/standards.pdf")
>
> [Call Browser]^c^c^p(command "browser" "n:/training/standards.htm")

Second. Set up an area on your corporate Intranet or CAD server where all your training materials can be stored, and set up read-only HTML or PDF files for all CAD users on the network. This allows you to "point to" the training resources from a web browser.

Third. Set up an old-fashioned lending library so users can check out books, DVDs or even printed copies of your training handout sets. Some people like to read and are willing to do so on their own time, so why not support them by getting them resources. As a bonus, a lending library is cheap to maintain!

6. Training + Persistence + Standards = Improvement

If you use my methodology for producing an in-house training program, I think you'll find that it isn't as hard as you thought. You'll also find that by taking control of the training process you really will reap the benefits of a better trained CAD workforce that asks fewer questions and follows procedures/standards better and that new employee orientation is much easier. In fact, by dovetailing your training classes with building a training library, you're actually solving multiple problems! And we all know that getting two jobs done at once is the ultimate in efficiency.

When in doubt about why you should persist in user training, ask yourself the following questions for perspective:

- How else will I cut down on user questions?

- How else will I educate users on standards and better processes?

- How else can I better use and recycle my time?

- How else can my users learn advanced concepts if I don't provide some way to learn?

When you think of training from these perspectives, it becomes clear that embracing training helps get better business results all around. And getting better business results is what will get your management's approval to train.

Special Topic: 3D Software Training Topics

If you've ever tried to teach users how to use a 3D system you've no doubt learned that just because someone is proficient in 2D CAD does not mean they'll take to 3D CAD well. It can be a wrenching experience for your design staff to watch experienced 2D users simply "not get it" in the 3D world. You can expect to experience responses from anxiety to hostility from those who don't want to change to 3D methods. Conversely you can experience joy and great satisfaction from those users who do "get it" and see their careers going to a new plateau based on new skills.

It will be your responsibility to frankly discuss the staffing issues in your department with your management before you embark on training efforts and software implementation. Since management's perception may be that everyone will learn 3D just fine it is imperative that you at least plant the seed of doubt in their minds so they'll know some turmoil is on the way. Much like I stated in the section on setting management's expectations, if you don't warn management about staffing issues that could arise with new software you'll be blamed for the turmoil!

Staffing: Who to Train for 3D?

A simple question with no simple answers. While I've not found a uniform set of recommendations that work in all circumstances I've found a few general do's and don'ts that seem to work almost all off the time. I'll divide these recommendations into "do" and "don't" categories as follows:

Do Train:

- Those who are enthused about the challenge of learning 3D.
- Those willing to put in their own time and independent study effort.
- Those who see 3D as a major new career skill.
- Those who have been willing to take risks and challenges in the past.

My reasoning for the above "do train" criteria is that they always point towards the sort of people that are receptive, self motivated and career minded. The sort of folk who fit these criteria will produce good results for your initial 3D training program and will serve as an "early basis for success" that can be used later to document progress.

Don't Train:

- Those who seem skeptical of 3D design.
- Those who publicly downplay 3D methods in meetings or memos.
- Those who aren't highly involved with CAD and design already.
- Those who seem to have a generally negative attitude towards change.

My reasoning for these "don't train" criteria is that weeding out the doubters, nay sayers, non-users and non-motivated you're much more likely to have a successful training program. The bottom line is that implementing a 3D design methodology is going to be tough enough if you have people who actually want to see the change made, let alone having to carry along those who aren't committed to seeing the transition through.

What to do with those Who Can't Learn 3D?

Another simple question without easy answers. The reality is simply that not everyone can be productive with 3D design software in a reasonable amount of time. My experience has been that closely examining your design labor needs typically reveals that not everybody really has to know 3D for a company to make valid use of 3D systems. So while you'll need 3D design gurus you'll still need 2D drafting, bill of materials preparation and checking functions, most of which can be done without 3D modeling knowledge.

So before you rush off to train everybody in sight consider the idea that you may not need to and that those who don't respond well to 3D modeling may have a better use in other areas anyway. You should be able to tell relatively quickly who has 3D aptitude and who doesn't and you should then make your staffing adjustments promptly, not letting the situation fester.

The entire question of who will, or won't, excel in 3D systems points out the fact that transitioning to 3D design systems isn't always smooth as far as staffing is concerned. But then nobody ever said a profound shift in technology would proceed along perfectly or not ruffle some feathers along the way.

Want the PowerPoint?

I'll be happy to send you a copy of the session PowerPoint presentation. Just send an email to me at **rgreen@cad-manager.com** and be sure to put **CM311 - PowerPoint** in the subject line so I'll know which class you attended.

I'll send out PDF captures of the PowerPoint files upon my return to Atlanta.

Reference Materials

You can find a wide range of information on CAD management and business metrics at my web site - **www.CAD-Manager.com**.

For a complete guide to a wide variety of CAD management topics including IT, personnel management, software configuration tips and much more, you may want to check out my new book: *Expert CAD Management – The Complete Guide*

To learn more please visit:

www.cad-manager.com/book