



Autodesk
University
2007

CAD Manager's Handbook 2008, Part 1

Robert Green – Robert Green Consulting Group

CM201-1P

Distilled from Robert Green's popular *Cadalist* "CAD Manager" column and his 16 years of CAD management experience, this lecture session is designed for the working CAD manager who wants to get a more organized, proactive CAD management environment established. This presentation will cover the market factors that drive CAD management duties, defining your own job description, getting organized (and staying that way) and how to report it all to your upper management so they'll support you. Along the way extended discussions of standards, machine environments, enforcement of standards, staff leveraging and enhancing your user's effectiveness will be presented with a constant slant towards becoming more effective, productive and respected. Whether you're an experienced CAD manager or just getting started, you're sure to gain practical ideas you can start using immediately in any industry discipline.

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 *Cadalist* 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.

Web site: www.CAD-Manager.com



Autodesk
University
2007



Section 1: What Makes a Great CAD Manager?

The CAD Manager Profile

Before delving into what CAD managers do, I'd like to draw a profile of the successful CAD managers I've seen on the job. While these profiles certainly don't fit everyone, they do a good job of conveying the type of personality, education and experience that make a great CAD manager. As you read through these various traits, see which areas you excel in and where you need improvement, so you'll know where to concentrate your efforts.

Education and experience. Most CAD managers come from a design, engineering or architectural background with a two-year associate degree or four-year bachelor's degree. Most have at least five years' experience in their field as a production designer, drafter, engineer or architect. Most are considered to be power CAD users and have a proficiency in CAD that naturally suits them to the task. More important, they are often up-and-coming types who find themselves being the "go to" resource for CAD questions and have been quickly promoted to their managerial positions.

Technical proficiency. Great CAD managers understand inside and out the CAD software their offices depend on. Phrases like *self-sufficient* and *quick study* describe these CAD managers perfectly and illustrate their approach to figuring out problems. Simply put, great CAD managers are able to solve most technical problems that arise in the office without having to resort to outside support. While some proficiency is gained by learning company history, much of the successful candidate's approach is a positive attitude. You can't train someone to be a quick study or to think on their feet; people simply achieve those characteristics through effort and hard work.

Programming skills. The great surprise here is that many successful CAD managers have little or no programming experience when they start out. In an AutoCAD landscape, the ability to edit menu files or do some light AutoLISP programming is certainly a plus, but not a requirement. While I would recommend that any CAD manager pursue some education or practical experience in programming, programming skills don't seem to correlate to being a great CAD manager.

Managerial skills. If you've read my CAD Manager column, you know that I advocate building your managerial skill set to the maximum possible extent. The reason I recommend learning to manage is because the best CAD managers I've seen are those who manage their departments the best, not those who know the innermost details of AutoLISP functions. Managerial skills include hiring, staff development, budgeting and new technology implementation. A lot of people and actions have to be coordinated to keep a CAD department running smoothly. No amount of AutoLISP programming is going to help when it comes time to hire staff or increase worker productivity.

Transition skills. Most CAD managers move up from the power-user technologist level into management. The best CAD managers realize early on that they have the technical skills they need but will have to learn more about management. The key here is the realization that becoming a CAD manager is a real career shift. If you recognize the transition and embrace it as a challenge, you'll move into management much more smoothly.

Communication skills. CAD management is highly dependent on being able to communicate effectively. The role entails written communication (standards, procedures), verbal communication and even formal presentations to upper management. Effective writing tends to be the most important communication skill you can master, while the ability to deal with people directly and personally in simple language becomes key in staff management tasks.

Section 2: The CAD Manager's Tasks

Now that we've qualified what types of characteristics and qualifications a CAD manager possesses, we'll list the various functions that you can be expected to perform in today's workplace. You won't need to perform all the following tasks, but you'll probably need to perform most of them at one time or another.

Maintaining hardware and software. The most basic function of the CAD manager is to keep the CAD machines running and to coordinate network procedures for storage of CAD data. Sometimes these responsibilities can be shared with a central computer support department, but the CAD manager must always take the lead in solving problems and will always be the responsible party. In fact, many CAD managers I know could work in centralized computer support departments but elect not to because CAD management keeps them in their design skill area.

Providing primary CAD support. CAD managers must be able to answer most of the questions that arise daily. This requires familiarization with all software platforms in the company and may require in-depth, self-directed study or training on an ongoing basis. Another way to state this is that the CAD manager becomes the "go to" authority on any CAD problem.

CAD standards formulation. A key part of any CAD department is working to either a company CAD standard or a customer standard. You have to take the lead role in formulating and enforcing CAD standards for layering, dimensioning, text annotations and information storage. The enforcement of CAD standards correlates closely to how effectively you communicate the importance of standards and get upper-level design or engineering management to agree to the standards.

Technology resource planning. More than ever, CAD managers are being required to look into the future to plan for new software releases and decide how to make the CAD department more efficient. CAD managers are much more likely to keep up with new technology now than a few years ago. Remember that planning for resources and new technology isn't just about being a futurist; you'll need to establish budgets and cost justifications to back up your recommendations. The best CAD managers are constantly reading and maintaining folders on interesting new technologies. You may also find that an annual conference like Autodesk University can assist you with identifying promising new technology for your CAD department.

Document/archive management. Increasingly, CAD managers are being thrust into implementing document management solutions as an extension of the CAD standards or procedures portion of their job. The control of CAD information to ensure proper revisioning, archiving and perhaps even Internet access is a rapidly growing part of CAD management.

Staff management. Sometimes CAD managers are responsible for hiring CAD drafters and must oversee temporary staff to ensure that CAD projects are completed on time. In these situations, CAD managers have a full-blown management job, which makes them responsible for anything from scheduling resources to performing reviews to disciplinary procedures. This is a huge step up for those undertaking their first management position and should not be taken lightly.

Staff training. CAD managers are frequently called upon to orient new employees or to help existing employees beef up their CAD skills. The forward-thinking CAD manager will devise a training plan that allows them to leverage industry training books, Internet sites and multimedia training materials to meet these needs, rather than putting the time into one-on-one tutoring. The CAD manager's approach to training is crucial because a strong training culture makes adoption of CAD standards much easier.



Section 3: How to Excel as a CAD Manager

From time to time I get comments from CAD managers such as, "I don't care about this management stuff; I just want to dig into the technical material." Although I have sympathy for those who feel that management shouldn't be a day-to-day portion of the jobs, I must remind you that your job title is CAD Manager. Like it or not, management is a part of the job.

Let's remind ourselves why we became CAD managers in the first place: We all showed the ability to deal with technology and somehow make it all work. That means we've shown the tendency to solve problems, find answers and somehow project enough confidence to make people believe we know what we're doing. These are the skills that set CAD managers apart from CAD operators, and these qualities are rare. So now the big question: How can we excel at the technical work we've come to love while bearing the burdens of management in an industry that changes so fast?

Organization: Understand Your Workload

It's been said that the hardest part of management is simply knowing what you've got to manage. You must understand what tasks you need to complete and when your deadlines are. Although it is tempting to just complete tasks as they come to you, you'll never achieve managerial control if you're reacting to the situation. You must first understand the variables and chart a course for how you'll fulfill your obligations. By proactively planning to complete key tasks, you'll be surprised less often, and when an emergency arises you'll be less stressed and better able to deal with it.

Simple techniques like keeping a manual list of tasks with you will help you plan your time. Unlike electronic calendar programs and PDA's that tend to be out of date or run out of batteries, the trusty notepad always works, never locks up, and is always in front of you. Since management is the art of juggling details with apparent ease, you've got to keep track of the details!

Organization: Plan for Increasing Demands

There's an old management adage that says, "Give your hardest work to the person who's working the hardest." This means that the person who is already pulling more than their weight will get more work. Why? Because that person somehow finds a way to get the work done. As CAD manager, you will most likely be that person. Take this new load of work as a compliment — if you weren't good, they wouldn't be asking you for more!

If you're effective at meeting deadlines and somehow getting the work done, you're cultivating the best management reputation you can have. When people say things like, "How does he do it?" or "She just gets things done!" you're building a great reputation. Just understand that as your reputation for doing the impossible grows, you'll be asked to do more impossible things. The increased demands on your time will emphasize the need for the scheduling and planning we've talked about if you're to live up to your increasing management burden.

Build Your Reputation for Success

CAD managers are sometimes viewed in a negative light because they're always asking for money rather than contributing it. Think about this statement for a moment: When CAD managers ask for new



hardware or software systems, they are perceived as merely asking for more money. Most people simply think your CAD department should complete drawings and documents, and they couldn't care less about your computer hardware.

CAD departments don't make million-dollar sales deals. They don't create wealth. They exist to provide a function. The best job a CAD department can do is quickly and efficiently complete the job they are tasked to do. The only selling point the CAD manager has is to show how more work is being done in less time with fewer employees.

Fortunately, good management can often be a matter of setting the right policies in place to gain better efficiency at zero cost. The old adage of "work smarter, not harder" plays right into this approach. If you can demonstrate that you are getting the best performance from your staff given what you have to work with, then you'll be seen as a great manager. Understand that as you build your managerial reputation for efficiency, your requests for funds will be trusted more and questioned less. You'll be viewed as an established manager who is credible and competent, and who inspires staff productivity.

What Skills Can You Improve?

CAD managers have to be more communicative and more grounded in business logic than they were as power users. Therefore, you should have the following skills on your mind and you should self-assess which items you need to improve on:

Writing. Can you write executive summaries, quick reports and cogent email that conveys your message without being overly technical?

Speaking. Can you communicate in short presentation formats using tools like PowerPoint? Can you speak extemporaneously without being tongue-tied or nervous?

Budgeting. Do you understand how to work up a basic budget and communicate that budget to your management?

Staff. Can you supervise people with ease? Can you relate to staff members who don't work in your department? Can you get people to work with you?

Business awareness. Do you know what kinds of business factors affect your company and, therefore, how your CAD management plans might be affected?

My experience has been that most CAD managers can improve in all these areas. I'm still struggling to get better at all these skills myself! So why not pick the one you feel weakest in and focus on improving in that area before moving on to the next skill. If you work at it you'll get better!



Section 4: Bottleneck Analysis

Focus: Eliminate Snags and Bottlenecks

CAD managers enjoy an interesting view of the engineering landscape – the view from the end of the process. Development, engineering and design have already been largely completed, so the chances are that as CAD manager you already know the snags and bottlenecks in your company's work methods. This means you are in an excellent position to take an active role in solving the problems before they arise for your department.

If you can suggest a way that CAD work can be done in parallel with engineering, for example, you may provide a way to get your work product out the door faster. If you can find faster methods of checking or routing documents to cut rework, you'll lower costs. Use your unique view of the work process to make your CAD department an example of what can be done when training, technology and good management theory converge. If you embody ideas that improve your company's profits, you're going to be a hero with a bright future.

List Your Snags and Bottlenecks

Now write down some of your ideas to improve your operating environment. We'll use these later.

1 _____

9 _____

2 _____

10 _____

3 _____

11 _____

4 _____

12 _____

5 _____

13 _____

6 _____

14 _____

7 _____

15 _____

8 _____

16 _____

Section 5: Getting Standards in Place

Here are some checklist items you can use to help get your environment more organized and standardized.

Know your environment. To standardize CAD machines from disparate locations you must understand the network environment you're operating in. At minimum you must understand the connection speed and validation mechanisms by which your remote users log into the network. Connection speeds can range from dedicated T1 lines to DSL to dial-up modems, while log-in validations will be controlled by your network administrators. If you aren't sure about what the connection speeds are for your company, ask your network administrator. The connection speed parameter will be very important later in our discussion as we talk about remote loading of files. Generally, T1 or DSL connection speeds should be adequate for wide area CAD management, while dial-up modems are typically too slow.

Deploy a standard drive. No matter what connection speed your company has, you should now set up a standard support drive letter (I'll call mine drive X) for all network users. This standard drive will serve as a central location for all the standardized files from now on. You'll need to get your network administrator involved early in the creation of this drive because it can sometimes take a while to get everything debugged. Once the drive is set up, you can create a folder on the drive (I'll call mine CAD Standards), and ask the network administrator to set up the folder with READ level control for all CAD users and FULL CONTROL for you. This permission scheme will allow you to have complete control over the CAD standards folder(s) while preventing tampering by curious CAD users.

Control your key files. Now that your CAD users can connect to the standard CAD drive, you can place your standard files into folders for optimal organization. AutoCAD must then be set to point to these directories. A network drive can control AutoCAD's support directories, plot style directory and template file directories. You can control other key files in AutoCAD's installation (like fonts, help files, etc.) if you want to. Consider the three directories I've outlined as being the minimum set of files you'll need to standardize.

Deliver documentation on the network. Assuming you have CAD standards documents or procedures, why not deploy them over the network as well? Using universal digital formats like Acrobat's PDF or browser-based HTML, you can deliver your CAD standards directly from AutoCAD's desktop and avoid printing out standards manuals. This approach means you won't have to worry about who's working to what standards manual because the official standard will always be on the system. And if users really must use a printed copy, they can print it themselves.

Enforcement of Standards

Given that many CAD managers have project oversight responsibilities, you may need to check tens or hundreds of files for standards compliance at the termination of a project. The good news is that AutoCAD comes with a stand-alone tool called the Batch Standards Checker that allows multiple drawings to be checked at once.

In many ways, the Batch Standards Checker has the feel of the batch plotting utility that AutoCAD has included in the last few releases. You simply select the drawing files you wish to process and add them into the Drawings tab of the dialog for checking. Then you use the Standards tab to select the DWS files that will be used to perform the checks on the contents of the Drawings tab. The process of



checking is then started and the results of the check can be written out to a CHX file that can be viewed in or printed from a browser. Although the Batch Standards Checker won't automatically fix drawings, it does compile all deviations from standards into a report that could be given to vendors or CAD operators as a punch list of items to fix.

It is hard to overstate how powerful the Batch Standards Checker is. You really have to experiment with it to appreciate how quickly it can process files for standards compliance. And the fact that it can generate a punch list-style report that can be forwarded to vendors is simply the icing on the cake. I think this tool alone justifies AutoCAD upgrade pricing just to track vendor compliance!

Use Your Success to Drive Standards Further

Now that you've demonstrated how well standards can solve problems and make you more efficient, don't lose momentum. Talk with your management and make sure they know the success you're having with your new emphasis on standards. Don't be bashful in advertising what you've been able to achieve, and be sure to point out any cost savings you've gained.

Section 6: Staffing Metrics

Now that you'll be dealing with more work, it is time to realize the following: No single thing you do as CAD manager will help you succeed as much as building a competent staff and delegating as much as possible to them.

Delegate, Train and Build Your Staff

As technologists, CAD managers frequently fall into the "I'll do it myself" or "It is easier for me to do it than train somebody" mindset. While both mindsets can make things easier in the short term, you can't expect to do everything yourself. If you do strive to do everything on your own, you'll reach a point of saturation where you just can't do anymore. At this point, your sterling reputation will start to give way to comments like "He's reached his limit" or "She needs time to grow into the job." If you choose to do everything on your own, you'll limit yourself needlessly.

By training staff members to run backups, monitor project progress or assist in scheduling activities, you're freeing up time to do more valuable work. You're not just training staff members with this type of activity — you're evaluating which staff members are ready to move up to more responsibility. Don't view training as a chore; view it as a valuable management tool that can leverage your time more wisely. And make no mistake: Using your time wisely is what moving up in management is all about!

Remember two rules:

- **You can't do it all**
- **Delegating is not a dirty word**

Section 7: Targeted Training Concepts

I receive a lot of email that asks, "How do I get my management to approve training?" To answer this question in one phrase I'd say, "Because we'll be more efficient and streamlined after the training is complete, so we can save the company money." Of course it will be up to you to live up to these compelling promises, so you'd better be ready for the challenge.

Get the Ball Rolling

While formulating your training regimen, ask yourself the following questions and you'll automatically focus on the right areas for training:

- What are the questions I get asked the most about our CAD software?
- Are there any CAD procedures or repetitive tasks that people have problems with?
- Where do we lose the most time, and what could we do in a training environment to cut our losses?

Now that you've created a list of questions and time-sapping problems you'd like to address with training, you can put the items in a list with the greatest savings potential at the top. This prioritized list now becomes your training table of contents that you will show to management to get your training program approved. You may even want to write a short paragraph on each topic, explaining how training will eliminate the problem and roughly how much time can be saved to demonstrate the cost savings potential.

You may only get approval to train on certain topics on your list or you may get a certain number of training hours approved, so be sure you prioritize in a way that saves the company the most and gets you the best value for your training time.

Section 8: Reporting it all to Management - Why and How

With all the tasks you juggle as CAD manager the last thing you want to worry about is writing reports to your management right? I sympathize. Writing reports can be drudgerous but there are some very compelling reasons to do so. Specifically, the benefits CAD managers enjoy when they engage their senior manage staffs via good reporting are better communication, fewer misunderstandings and generally better rapport.

Let's be honest, you're the only CAD manager at your company and nobody else really understands what you do that well right? This lack of understanding means you operate in a vacuum where you and only you know why you're doing what you're doing. And when nobody else understands what you're up to those around you can form incorrect perceptions that can make you job even more difficult.

In order to target what facets of your job you should report on you need to combat the misperceptions that exist in your company. Each case is, of course, different but the common misperceptions I've seen CAD managers suffer through include the following:



CAD management is easy. When people don't understand the details of what you do they will almost always underestimate how hard your job is. And when users or management think your job is easy they'll try to load more tasks on you thus reducing your effectiveness even more.

CAD management is only a software issue. When management thinks CAD management is just about software they clearly don't know how many training, support, negotiation and human resource problems CAD managers deal with.

Not understanding upcoming dangers. Let's say you have a large volume plotter is that is outmoded and a maintenance problem but replacing it will be expensive so the issue just keeps getting put off. If you, and only you, understand the consequences of having a major plotting failure then everyone will be in shock when the problem actually happens. And believe me when I say that you'll hear the following question, "Why didn't you tell us?"

CAD management is all overhead. When management thinks CAD management is all overhead they start to question why CAD management is needed at all. And when your senior management questions if they even need you then there's clearly a misperception of what you're actually doing.

Why Reporting is Crucial

So if you'd like to avoid all the nasty consequences of your management not understanding your job what should you do? You should educate them with the right types of reports so that they never again mischaracterize what you do, that's what! Therefore, you should find ways to keep your management in the loop using the most economical reporting format you can – more on that shortly.

Remember, you're the only person who can report on what's happening with CAD management so if you don't do it who will? In fact, the biggest reason that CAD management misperceptions exist is precisely because most CAD managers don't report to their management in a regular format that is easy for senior management to understand. So let's see how to make reporting really work for you with minimal effort.

A Format that Works

A simple way that I've found to report involves using a rolling diary style format on a weekly basis. In this reporting scheme you track what you've done and what you plan to do in a brief one page memo and publish it to your management team on a fixed day each week (Monday's or Friday's tend to work best).

The advantages to this reporting style for you are:

- You form a diary of tasks that documents the wide range of material your work on that will serve to reinforce your value when it comes time for your performance review.
- You get the benefit of review what you've actually achieved each week which keeps you focused on what you're trying to accomplish. This sort of mental discipline is hard to maintain when fighting the common fires of CAD management, but a written weekly report will help keep you on track.
- You raise the awareness of what CAD management really is and how valuable it is by simply listing your tasks for management to read about. In a sense you can brag on yourself without actually bragging if your weekly report shows your boss how much you do.

- You demonstrate to your management team how technical you are by documenting technical tasks while the very report you write demonstrates your management prowess. Again, this sort of self promotion just tends to happen when you present a well crafted weekly report.

The advantages of this reporting style for your management are:

- They are able to keep up with a lot of information very quickly since the report is written in a very brief style.
- They are able to keep up with how tasks you work on affect projects since your report is chronologically written. Remember that your management is probably more worried about how technology problems affect schedules than they are about how you actually resolve the problem!
- They are able to gain all these benefits on their own timeframe wherever they may be. This means that when you meet with your management in person you'll be able to really focus on key issues rather than having to answer a bunch of task based questions that you've already reported on.
- They actually start to understand the huge range of tasks you work on and come to understand that you have one foot in CAD space, one in production and yet another in management. They will come to this realization as they read multiple reports over a fairly long time span but the realization will sink in, trust me.

Bonus: Addressing Overhead

In addition to educating your management on what you're doing it is key that you address the issue of billable time versus overhead. Since many CAD managers are working engineers, architects and designers that battle over what's overhead and what's job billable will always be an issue. One way to reduce your overhead is simply to make CAD management tasks report to jobs and to demonstrate that in your reports.

To make the concept of overhead reduction clear in your reports take care to emphasize which tasks in your report facilitated job production and versus which ones are overhead. You'll note in my sample report that even for tasks like standards formulation or project kickoff coordination I've stressed which job the tasks reported to. By stressing CAD management tasks that actually facilitate job completion that you'll be more able to bill the time to actual jobs than overhead. And even in cases where you can't, at least your reporting is showing management that your overhead activities really do have a positive impact on billable jobs.

In Summary

The CAD manager's job is hard enough when your management knows what you're doing and supports you, but is darn near impossible when they don't. So rather than complaining about your management not knowing what you do why not use reporting techniques to fix the problem and gain support all at once? I've found that the regular, diary style reporting format I've illustrated allows CAD managers to stay on track, manage the details of their job, educate their management and earn managerial support all at the same time. And from the standpoint of time management, isn't achieving all these results at once a good thing?



Section 9: Re-Build Your Job Description

Based on the common CAD manager tasks I've outlined you should now evaluate what you do in your company and try to list the order of priority. I find it very informative to write down which tasks you're actually performing and rank them based on what you're doing now and the priorities you'd like to be pursuing.

As you examine your tasks, priorities and changes to those priorities a job description and set of goals will emerge. Go ahead and take a few minutes to complete this worksheet and see what happens. (I filled out a couple for you to get the ball rolling)

Tasks	Current Priority	Desired Priority
Answer the same old questions	1	9999
Unjamming the plotter	2	9998
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Now that you know what you're doing and how your priorities need to change you can write your job description in today's context and see what you need to do in the next year to move towards your desired priorities. Example: Want to quit answering the same old questions? You need to strive to find ways to make those questions go away via clever use of teaching, standards and user management.

By auditing what you're doing you'll learn what you need to be doing better. It does work!

Section 10: Don't Quit!

CAD management is an ongoing process that never stops and is never easy.

However, if you attack the job from the angles I've described you'll stay saner and get better results with less effort. So keep at it and never quit becoming a better CAD manager.

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 **CM201 - 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

