

Nov/Dec 2003



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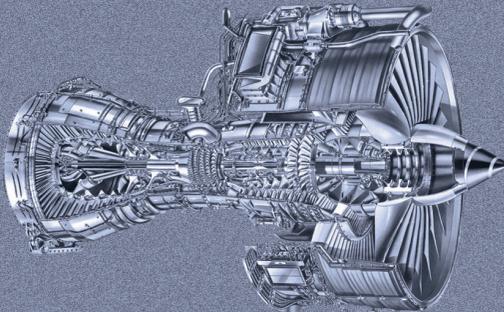
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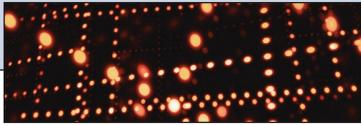
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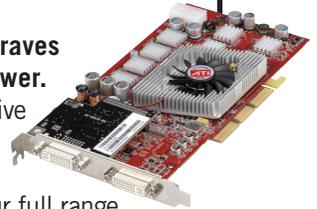
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The Cad Manager



John Clauson

I is for International

You may be wondering why this CAD Manager column is about AUGI and its international agenda. I'm taking that liberty for several reasons besides the fact that it's my column. One of my primary goals this year as the AUGI president has been to improve the international character of the organization. A recent trip to Japan reinforced my previously stated opinion that culture is a very significant aspect of our lives, including our CAD and other business activities. Examining other cultures helps us take a fresher look at our own. Also, a frequent question posed by several of my new friends there was, "What does a CAD Manager do?" They don't have CAD managers in as many companies there as in the U.S., so I was the first one many of them ever met. Finally, we can all identify with their needs as Autodesk product users. I think that their work ethic and dedication to common user goals should be examined and applauded, as well. So, I believe that all of those elements touch in one way or another and contribute to the kind of information you might usually find in this column.

I must point out that AUGI does not have the resources for such international travel, so we express our deep appreciation for the support we received from Autodesk in Japan, especially Tetsuya Shiga, the president of Autodesk, Ltd. I also want to personally thank John Sanders, executive vice president of the Design Solutions Division, for his thoughtfulness and his commitment to AUGI.

My magical trip to Japan began with an invitation from Ms. Yukari Tanaka, a marketing specialist for Autodesk Ltd. in Tokyo. Speaking for Mr. Tetsuya Shiga, the president of Autodesk Japan, she invited Lynn Allen and me to speak in late June at Autodesk College. She said it was a test

event for a future Japanese version of Autodesk University. Lynn was to do a presentation on the new features in AutoCAD 2004, and I was to talk about AUGI and Autodesk University. Lynn is a well-seasoned world traveler, but I have never been outside the U.S. except for short forays across the Mexican and Canadian borders. We both happily accepted and the fairy tale began. Little

AUG-JP is a dynamic organization, led by President Mr. Hiroshi Hoshino and Vice Presidents Mr. Ryoichi Murakami and Mr. Yuji Suzuki. Mr. Hoshino is a mechanical designer, while Messers Murakami and Suzuki are in the AEC world.

Board members Ms. Yuri (civil) and Mr. Haruka Toya (mechanical) operate the terrific AUG-JP website. The remaining board members are Mr. Kenji Tamada (AEC), Mr. Masao Sakai (mechanical), Ms. Mayumi Hikono (civil), and Mr. Toshihiko Kanetake (AEC). If any of those names are incorrect, I beg their forgiveness. It is one of the many aspects of language difficulties that face us as we increase direct contacts within the more than 200 countries with AUGI members.

Lynn and I arrived on June 25 at the Autodesk offices in Tokyo. After some delightful introductions to several staff members and Ms. Junko Iwashita, our superb inter-

preter, we began preparations for our presentations. During that morning we were also interviewed by two CAD magazines. The interviewers had much the same kind of questions about the U.S. CAD culture as we had about the Japanese counterpart. The editor of one of the magazines expressed sad surprise that there seemed to be fewer "CAD fans" among the younger users. We remarked that we've noticed the same thing at some of our local user groups and discussed several potential contributing reasons. Meanwhile, Autodesk College was in full swing.

Ten staff members and nine speakers provided a full day of classes and breakout groups that earned highly positive evaluations from 97 percent of the 112 attendees. It is noteworthy that many of the staff and presenters were AUG-JP volunteers. After morning sessions in AutoCAD LT and a



Top row, left to right: Toshio Ito, Kenji Tamada, Toshihiko Kanetake, Yiji Suzuki, Lynn Allen, John Clauson, Hiroshi Hoshino, Haruka Toya, Masao Sakai, Ryoichi Marakami. Front row, left to right: "My," Yoshinin Ueda, Satomi Tsujii, Yumi Ito, Mayumi Hikono, "Yuri," Yumiko Nakajima

did we know how wonderful a guide and caretaker Ms. Tanaka would be.

Almost immediately I received an email from Mr. Yuji Suzuki, the vice president of AUG-JP, the nationwide Autodesk user group in Japan. Fluent in English, he offered his help and said that he remembered meeting me at AU 2002. He was ever so helpful during the extensive preparations, the visit itself, and afterwards with this article. Domo arigato, Suzuki-san.

AUG-JP is a very interesting story for anyone involved in user groups. Starting in 1999 with fewer than 50 members, it grew rapidly to a roster of more than 5,700 by September 2003. There are no local chapters, but AUG-JP has meetings four times a year and elects its board of directors annually. Like AUGI, membership is free and their organization functions mostly through a website, www.aug.gr.jp.

general FAQ, Mr. Hoshino spoke about AUG-JP before Lynn and I did our segments. I've seen Lynn on dozens of occasions, but it was a treat to see her terrific PowerPoint slides displayed in Japanese, as well as watching her tailor her dynamic presentation skills for working with an interpreter.

The audience was extremely attentive and focused during our segments. Many of them understood some English, as was evident from reactions that often came before the interpreter was finished with her translations. They were very eager to know about CAD in other countries and all about AUGI and what we offer our members. It was definitely one of the warmer receptions I've experienced this year.

The rest of the day was divided into parallel sessions. One dealt with architectural topics, AutoCAD LT and customization, while the other covered Mechanical Desktop, Inventor, Architectural Desktop, Revit, and Autodesk VIZ. AutoCAD LT was very prominent in the event, by the way, which is indicative of its popularity in Japan.

The seminars ended and the reception began at 6:00 p.m. The evening was simply magnificent, with kind and charming people and a splendid buffet. From the first moment in Tokyo I had been captivated by the Japanese culture of politeness and respect. That evening we were also moved by their sincere friendship and genuine curiosity about life in the U.S. and us as individuals.

That is when the surprising questions about CAD managers began. What is a CAD manager, and what does one do? How many companies have them? And so on. My unscientific questioning of the attendees I met that evening did not give me enough data to draw any conclusions, but I suspect that there must be fewer Japanese companies with CAD managers than in the U.S. Both Mr. Hoshino and Mr. Suzuki perform CAD management functions as part of their jobs, but do not have the title to go with the duties.

When my friend Yuji posted some survey questions on the AUG-JP website, several of the respondents had not even heard of a CAD manager. Evidently, CAD software support and customization is typically performed by individuals with design and drafting duties, but is not often defined as a budgeted position. Readers should again note that those conclusions are not at all scientific and are based on a small sampling of casual conversations. Nevertheless, I found the subject fascinating and worthy of further exploration.

In other areas our comparative CAD cultures appeared similar. Many principals in AEC firms relegate the more advanced CAD operations to designers and drafters. Contract workers at the designer and drafter levels are very common, but Japanese workers in general seem to get fewer paid holidays and less health insurance coverage.

Getting back to the Autodesk College party, you will not be surprised to hear that Lynn Allen's fame transcends language as well as the Pacific Ocean. She was highly sought wherever she went, to the point of rock star admiration at times. You just have to admire the grace, good humor, and patience she maintains through it all.

Equally worthy of respect and admiration are the officers and members of AUG-JP. Long before the event, a team of their members headed by vice president Murakami had translated the entire AUGI website into Japanese. Their website is extensive and professional in every way. Collectively they are eager to learn and willing to work very hard to do it. I have the feeling that their level of volunteer commitment would make many of us wish we could engender that spirit in our own user groups.

Seeing that hunger and eagerness led me to reflect on brief email encounters I've had with folks in other national user groups, such as in Spain and the UK. We all have the same reasons for banding together into local user groups in the U.S. and regional or national groups in other countries: the needs for as much product support as we can get and the benefits of sharing experiences with our peers. That is why in a recent *AUGI HotNews* I made the call for national user groups to encourage their members to also join AUGI. After all, we in AUGI have no interest in taking over or replacing local, regional, or national groups. On the contrary, we want to help them grow stronger by providing services they can't and by increasing our unified voice at Autodesk and its partners.

In closing I'd have to say that my brief visit to Japan reinforced my belief that no matter the country, we Autodesk product users have more similarities than differences. Learning to work more closely through AUGI will pay off not only with more information for all of our members, but with greater appreciation and respect for our colleagues around the world.

John Clauson is CAD Manager at Indak Manufacturing and President of AUGI.

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THE BEST OF CAD EVERYTHING!

» The votes are in...here are your picks (and some of ours) for favorites in several categories

It's a year-end thing. There's something about flipping to December on a calendar that makes one reflect on the 11 months preceding the final one. In the CAD world, a year is filled with creativity under pressure, deadlines, productivity-boosting techniques (plus a few time-wasters), drawings (some bad, some brilliant). There are the highs that come with discovering the usage tip or new software feature that saves a ton of time or that one book that clarifies everything. And there are the head-banging lows that come from not for the life of you being able to get that #!^&! thing to work!

Last month we conducted an online survey asking AUGI members to share their personal "Best Of's" in several categories. We provided a dozen questions and were pleased with the number of responses. Thanks to all who participated.

1. Best AutoCAD 2004 feature

MTEXT (Multiline Text) improvements such as tabs and indents were crowd-

pleasers. "Saves a ton of time...and keyboards!" says one relieved user.

Xref notification, which alerts users when changes are made to a drawing set,

Best AutoCAD feature?

"Quit. Because that means the day is over!"

was another standout in our survey. One of the respondents says, "We work with tons of Xrefs, and it's good to know when they update. Especially BEFORE you plot."

"Tool Palettes rock! All my power utilities at my fingertips!" says one enthusiastic AutoCAD 2004 user. That sums up the feelings of several respondents, including this one: "They're there when you need 'em, gone when you're finished with them. What could be easier?"

"Multiple redo, because I always get click happy" was another vote in the Best

AutoCAD 2004 Feature category.

Many respondents commented favorably about the 16 million color options available in AutoCAD 2004. "It's nice to be able to add color and shades to certain drawings with the solid hatch pattern," says one. "Finally I can get the color results I want and don't have to use screening to get different shades," adds another.

A handful of our respondents were not using AutoCAD's latest release and couldn't comment. One of them, however, is highly optimistic: "We just received the software so I've not been able to assess how it rocks." There were also a few who had less-than-complimentary comments about AutoCAD 2004. The opinion of the majority, however, is that AutoCAD's latest provides real improvements.

2. Best Autodesk Inventor 6.0 or 7.0 feature

Apparently, Autodesk Inventor users were too busy checking out the software to

**Best training class you've ever attended?
"The one I taught."**

take our survey—there were fewer responses to this question than for the other survey questions. A few people commented, however, and here's what they had to say.

"Better importing of solid models from other packages."

"Expandable subassemblies in BOMs."

"A more intuitive interface modeling the parts."

"Improved features in the *.idw."

"The additional features for passing drawings to fellow team members on the Web."

...and these concise comments...

"Surfacing"

"Weldments"

"Sheet Metal"

3. Best AUGI program or resource

#1 – AUGI Forums (formerly AUGI Guilds)

#2 – AUGIWorld magazine

#3 – ATP (AUGI Training Program)

#4 – AUGI HotNews

#5 – AUGI Exchange

4. Best training class you've ever attended (including Autodesk University courses)

No consensus here, though many respondents expressed their appreciation to AU instructors such as Lynn Allen, Dave Espinosa-Aguilar, Scott McFarlane, and Robert Green, among others. One survey taker reached back a couple of decades to offer a pat on the back to his University of Michigan math teacher, Mr. Floyd. What loyalty!

Dealer-provided classes and community college courses in various parts of the U.S. were cited by several respondents. One lucky trainee was the only student to sign up for a dealer-sponsored course on upgrading from AutoCAD 12 to Release 14. He spent the next six hours in one-on-one instruction, getting answers to "every question I ever had about AutoCAD. I got an Autodesk coffee mug for being the best student in class."

It's all about the presentation. From our responses, it is clear that the course was fondly remembered when the instructor was good. This gem comes from a user who attended an AutoLISP class in Tucson, Arizona. "The instructor was so enthusiastic and you came away from the class so pumped up that you actually enjoyed the time you spent pulling your hair out trying to get routines to work."

Comments About Attire

"My vote for best wardrobe are the Hawaiian shirts worn by the AUGI board of directors as a tribute to Yoshi Honda (AUGI President 2002) at the Annual Meeting."

"Did you see the outfit the cocktail waitress *isn't* wearing over by the craps table?"

"The worst tee shirts or hats given at AU are any that say One Size Fits All."

And another. "There have been many [good courses], but the one that stands out was Bill Kramer's four-hour class on VBA at Autodesk University three years ago. He started at a very simple place that was fit for a beginner to the intermediate and worked up to some fairly interesting programs and techniques. That was an awesome introduction to AU for me."

5. Best AUGI Top Ten Wish List item that you know made it into the software

Funny...some of the responses mirror the list of favorite features in AutoCAD 2004. This should eliminate all doubts about the importance of the AUGI Wish List.

Tabs in MTEXT was the most-cited response to this question, followed closely by multiple redo and undo. Inclusion of Express Tools was another favorite.

One respondent took this opportunity to add a Wish List item. "I'd really like AutoCAD to incorporate the (AUGI) LISP program to find the area of an enclosure. AutoCAD can apply a hatch into such an area, but cannot quickly find an area."

6. Best Website to find Tips & Tricks, LISP routines, and share-ware programs

AUGI is a hit with members, it appears, since AUGI.com was listed most often as the best place to go for tips, routines, and so on. *Cadalyst* "Hot Tip Harry," www.cadonline.com, and *Cadence* were

mentioned, as were online portals Tenlinks.com and CADdepot.com. The afraisp.com site was also a favorite among several respondents.

7. Best Autodesk University "moment"

It's the party, it's Las Vegas, it's the event itself—our respondents all had a different take on the most memorable "moment." Surprisingly (?) many such moments appeared to occur while the respondents were under the influence of alcohol. And a number of respondents used this space to lament their inability to attend AU due to their employers' budget constraints or other reasons (Note to these folks: You should check out #11 – "Best Excuses" section!). We particularly like these responses:

"Realizing that the walk from my room to the AU area was a mile."

"Lynn Allen's face when they started handing out the huge posters of her!"

"AUGI Beer Bust."

"Carol Bartz announcing the winning numbers for the software door prizes."

"Winning at the "Let It Ride" table."

"Being alone without my family (husband and kids) for 4 days in Las Vegas. Priceless..."

"Putting my feet up at 1:00 p.m. on the last day."

"Having my picture taken with the dancing biker chicks!" (from AU 2002)

"The standing ovation at the end of the AUGI Annual Meeting."

8. Favorite Autodesk Product (top 10 responses)

AutoCAD

Autodesk Architectural Desktop

Autodesk Land Desktop

Autodesk Revit

Autodesk Inventor

Autodesk Map

Autodesk Mechanical Desktop

Autodesk Raster Design

Autodesk VIZ/discreet's 3ds max

AutoCAD Mechanical

Best Quotes from the Craps Table

"If I could just win enough money to pay for my next upgrade...or my flight. One or the other."

"Crap!"

Best excuse you've ever used to attend AU

"Cause it's Vegas, baby!"

9. Best CAD-related book you've ever read

Like our question about the best class you've ever attended, the responses to this question gave nods to the "presenters" (i.e., authors) more often than the books. Veteran author George Omura received accolade from many respondents, some of whom cited as their favorite books "anything he writes."

Paul Aubin's books about Autodesk Architectural Desktop are well-received, as is Lynn Allen's *AutoCAD Inside and Out*. Numerous Bill Kramer books also received "best of" votes.

Some of the more amusing responses were:

"I don't read." (We aren't sure if this means the respondent doesn't know how to read or just chooses not to.)

"101 Uses for a Dead Cat'...oh, you said CAD...um, I haven't read any CAD-related books lately. Just magazines."

"People actually write books about CAD?"

10. Favorite AutoCAD Tip & Trick

No consensus on this one. From shortcut keys to "every Express Tool," respondents had different favorites. Here are some of the responses.

"Too many to say. But I do have one that I like to use only in the customization side of the menus. I learned how to make a .dll file containing my .bmps. Now whenever I load my menu, I never get happy faces or ? anymore. Love that trick."

"Use of 'Reference' to rotate or scale an object...I teach drafting/CAD and this seems to be a big one."

"Wipeout with blocks."

"You can do anything with this software, so if you don't know, ask anyone before you do anything stupid."

Favorite AutoCAD Tip or Trick

"I'm not telling. That's my job security."

"Very simple, but I use it all the time—LAYISO"

"The 'Create Drawing' command. (Sorry,

couldn't help myself.) No, this is my favorite: selecting, and right-click-heating up the grip of an element and dragging and dropping it onto another drawing session. Now that is cool!"

"Rename xref to match your layer naming so that you can manage the xref as a single layer."

11. Best excuse you've ever used to attend Autodesk University

As we had hoped, most respondents (at least the ones who had attended AU) had fun with this question. There were the serious—"My supervisor attended one year because someone else couldn't make it. After that we didn't need an excuse"—and the clever—"I got to become enlightened!" Here are more.

"Most classes for the \$, and all in one place."

Best CAD-related book you've ever read

"None yet. But I should write one [titled] How to Manage Your CAD Manager"

"I don't need to make excuses. AU is that good!"

"If you don't let me go, I'll get pregnant again." My boss never let me go...I've given up...I've got three kids now.

"All of the AutoCAD geeks are going to be there and I could learn something from them."

"It's a tax writeoff!"

"I have to go, Boss. I'm a lab assistant in three labs!"

"Haven't attended yet...looking forward to hearing good excuses so I can convince my boss!"

"The University runs classes all day long. I will be way too tired to have fun in Las Vegas."

12. Best advice you ever received from your manager

Lots of advice out there, some of it sage; some of it, well, not sage. Bless the managers who help their employees put things

in perspective, as this respondent reveals: "We all have lives outside of work; family is important," was the manager's advice. The respondent adds, "I already

believed this, but it's good to have a boss who lets me live it."

Advice from good-guy managers...

"Sure, you can work from home."

"Keep up the good work. You're on the right track."

Best advice you ever received from your manager

"What happens on the road, stays on the road!"

"Upgrade those systems to faster machines!"

"Order it (pertaining to most any software package)."

"If you need something, ask for it."

"Don't stress."

"Be patient. You can't eat an elephant in one bite."

"Don't be afraid to make a mistake. If you didn't make a mistake I would think you weren't working."

"Go to AU in Las Vegas!"

This is motivation?

"Leave and become a manager yourself someplace else (aka 'You're Fired!')"

"You're not here to learn."

"Better update your resume."

"Go into a different field."

Some final thoughts from our respondents on advice from managers...

Best Autodesk University "moment"

"Every time I went into the women's restroom and didn't have to wait in line. Sometimes being a woman in a male-dominated industry has its perks!"

"My manager talks a lot without saying anything."

The Boss says, "Stay Billable."

Boss to respondent: "Don't tell me how it works, just tell me it works."

"My boss doesn't give advice, just orders."

We hope you enjoyed the "Best of Everything." Thanks again for taking the time to submit your responses. See you in Vegas!

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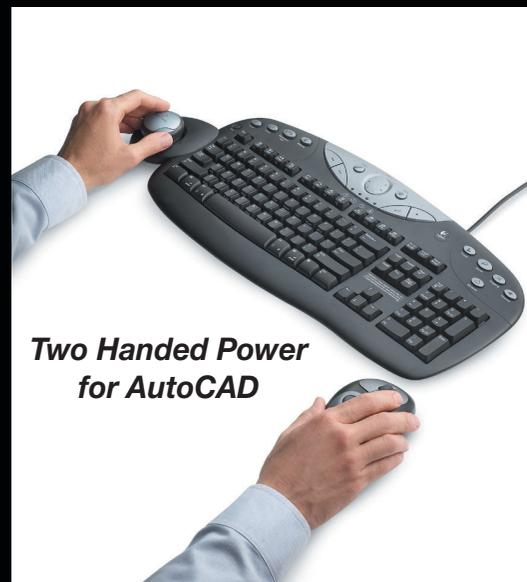
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What's In Your Future?

» *COFES, the Conference on the Future of Engineering Systems, yielded some surprises. Here is one analyst's take on what's coming*



I had the chance to attend the Conference on the Future of Engineering Systems (COFES, www.cofes.com) recently as a press representative for *AUGIWorld*. I knew that COFES events were high-level futurist gatherings aimed squarely at the CAD/CAE fields so I expected lofty statements about future capabilities. I wasn't sure about how much of the conference would be hardware or software or strategy, so I entered my COFES experience with no preconceived notions.

Now you should know that I'm a mechanical engineer by background and an early CAD adopter, having used AutoCAD since 1985. I enjoy all things technical and you can therefore call me a computer geek any time you want, no offense taken. (Heck, I consider it a compliment!) However, my business experience has shown me that blue sky future scenarios rarely come to pass unless they make good business sense. I therefore tried to temper my natural affinity for cool technical advances with a sense of what is realistic as I attended COFES.

My Strategy, Adjusted

When I arrived at COFES I couldn't help but notice the wide range of human expertise available and how every piece of the computer engineering equation was represented. The big software companies had representatives there as did hardware manufacturers, consulting firms, industry think tanks, members of academia, research scientists, and even press analysts like yours truly. COFES wasn't so much about telling

me what the future would bring, but rather putting me in close proximity to the people who would build the software, hardware, and telecommunications products I'll use in the future. It simply became my job to pick the collective COFES brain and try to interpret my findings in such a way that AUGI members might gain some competitive advantage from reading my article. No small task to be sure.

I settled on an adjusted strategy of finding trends of consensus within this community of futurists and then simply applying my own business and technical logic to draw some conclusions. I hope you find them useful. Here goes.

Faster/Cheaper Hardware

I was very surprised to hear how much the hardware vendors at COFES talked about increased computing capacity and how focused they were on cost. I was expecting to hear much more talk about lush new operating systems, 3D visualization/prototyping technology, or other more sexy topics. Instead the clear emphasis was on providing more value for business computing users so they can run more complex software at a lower per seat cost.

Vendor after vendor spoke of memory and hard disk densities that will replace entire racks of current servers on single machines within five years. Considering how much computers have shrunk in the past 10 years it seems entirely possible that a 10 gigahertz personal computer with 16 gigabytes of RAM and 4 terabytes of disk

space will be commonplace by the time we're using AutoCAD 2008 or Inventor 15.

Other neat prognostications I heard were: Key ring-sized memory sticks with 4 gigabyte storage capacities; memory substrates that can store the equivalent of 100 DVDs per square inch; parallel processing graphics systems that run as fast as the computer's native processor, and wireless computing platforms that rival today's wired networks.

Conclusion One: Computer equipment is improving a lot faster than the software we're using and the cost curve is essentially on a negative slope considering inflation. Think about this for a moment and you'll realize how true, and astonishing, it really is. Is there any piece of software you can buy today that is a factor of 10 times faster than it was four years ago yet costs less to buy? There simply isn't any reason why the average CAD user, 2D or 3D, shouldn't have a machine that can crunch through complex modeling and analytical tasks with ease in the next few years at prices that can place these machines in your home office. So while the last 10 years have seen computers playing catch up with CAD software, the next 10 years will see computers pulling away from our capability to keep them occupied.

Networking Technology

While COFES was abuzz with talk of Leviathan powered computers in Lilliputian packages, I was struck by a lack of conversation regarding networking technologies. Given this silence I made a concerted effort to ask about network technol-

ogy whenever I could and was, frankly, surprised at the outcome.

Generally, the consensus seemed to be that faster machines with higher data densities will make networks, at least in terms of server rooms, less and less relevant thus placing more emphasis on getting data to the user's desktop. To achieve this speedup, network switch gear and network interface devices will simply become faster by at least an order of magnitude, but nobody sees the venerable old TCP/IP network protocol being replaced. I found it really interesting that in a room full of technology futurists, nobody was talking about revolutionizing networks but rather viewing them as a tool that simply gets information to the consumer, ever faster.

Conclusion Two: With mass storage becoming so much more available and server farms being shrunk to single machine scale, small engineering departments should be able to manage their own networks without IT/IS involvement. The return of personal computing and small workgroup networks will be enabled with staggering power and centralized IT/IS will become less relevant. Think what it would mean if you could have all the information you need online, immediately available,

with no backup hassles and no bureaucracy to go through? So keep an eye toward learning about networks—you may be managing one sooner than you think! And even with complex 3D models it'll take your design department a long time to fill up those 4 terabyte disks!

Global Bandwidth on the Cheap

Some real debate surfaced when the topic of cost savings in Internet technology was brought up. For every person who said Internet speeds would rise and prices would stay flat there was another who said the availability of broadband Internet access must become more global before we'll see a big difference in world commerce. A minority saw the continuing globalization of business facilitated by better bandwidth as being the big future trend. The only real consensus I was able to get was that moving data around between offices will only become cheaper, faster, and more reliable whether it be via DSL in North America, satellite receivers in South America, or an evolving communications network in China.

You can see from the global nature of this conversation that speeding and widen-

ing the Internet's reach in terms of business is not just for those of us who work in the North American and European economies. There was strong agreement among telecommunications professionals that the Asian and Pacific Rim markets are investing heavily in Internet bandwidth as a way to do more business in Dollars and Euros. The perception was that recent outsourcing trends, from North America to India as an example, will only become more common as faster/cheaper bandwidth becomes the norm.

Conclusion Three: Technology is enabling everyone to move more data around the world than ever and this trend will allow more and more business to be done globally. Essentially, technology is removing the barriers of time and distance from doing global business. This trend toward global business will benefit some (those who gain business) and harm others (those who lose business) but it won't stop because the technology and savings are simply too compelling. Anyone anywhere should now be able to compete for business on a global basis as the old argument that workers have to be near the company they work for gives way to getting the best workers for the best value wherever they may be.



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Software

I bet you're surprised that I didn't get around to software until now, especially when writing for *AUGIWorld*, right? I'm surprised by this as well and I was very surprised that there wasn't more serious discussion of software trends at COFES. The big topic that came up at every discussion was interoperability or some sort of bullet-proof industry standard for information exchange between competing CAD packages. My business instinct has always told me that software companies are more interested in making their products better than they are in making them compatible, so I don't expect to see much movement on this issue.

A minority of attendees, myself included, seemed to agree that CAD software is getting better with each year but that no really staggering developments have been made in the last few years and we can't see any in the near future. The software vendors I talked to were very content to satisfy user requests for new features while trying to make software more reliable and easier to learn/work with to keep implementation costs down. More than a few vendors were honest enough to say that in these economically tight times they are listening to their customers very closely and aren't willing to risk major amounts of money on R&D expenditures that may never pay back.

Conclusion Four: CAD systems will be the most stable component of our future workplace precisely because businesses have already invested so much in them that it would be suicide to switch in midstream. As an example: If a brand new company came out with a product that was twice as good as AutoCAD at half the cost but didn't work with DWG files, it wouldn't make business sense to switch because of changeover costs. Because software has such a long learning curve and the costs associated with it, look for evolutionary, not revolutionary changes in your CAD software.

Collaborative and PLM Indecision

I've heard the terms collaboration and PLM (product lifecycle management) misused so much in the CAD industry lately that I've developed a Pavlovian gag response whenever I hear them. I was actu-

ally pleased to hear that many others in attendance at COFES felt as I did and were looking for vendors that could put some meat on the bones, so to speak. After listening to some very high-priced consultants outline their views on collaborative and PLM methodologies, I've come to believe that not only doesn't anyone understand these concepts, but that most vendors can't even define it. So if you feel bad in thinking you don't understand PLM or how to collaborate, relax, you're in good company.

I must say that after hearing all the experts I don't think anybody has figured out what collaboration really is but there are a lot of people charging outrageous consulting fees to try to figure it out. What has become entirely clear to me is that the CAD vendors, be it Autodesk or any other, view the ability to interoperate with data from

professionals is an uncertain one. We're no longer going to be defined by what company we work for and what experience we have, but by how much value we can provide and how productive we can be on any given project. Many of the technology trends coming at us are simply continuations of themes we've become accustomed to already—for example, faster computers that cost less—but the new trends of globalization and collaboration are largely unknown to us.

The career-changing thoughts I've had as a result of my COFES experience can be summed up in a few bullet points, which I'll present here:

- Know your software and what you do better than anyone else. Reason: Superior knowledge will be the future's only measuring stick for your value because it won't

matter where you're located anymore.

- Consider business ownership or contracting work arrangements. Reason: The future workplace will be more fluid, more competitive, and more uncertain than it is today. By running your own show you'll control more of your own future and will thus be less reliant on others to shape it for you.

- Don't fight the changes because you can't! The new CAD future is coming and I don't think anything will

stop the changes—not government, not economic policy, and certainly not wishing it away. Find a way to embrace changes in your professional life and make the best of a changing landscape by learning everything you can.

Summing Up

It is my hope that this article has given you a glimpse into some coming trends and some inspiration for how to posture yourself for maximum advantage. I'd be interested to hear how you plan to tackle your future. I welcome your comments via email at rgreen@greenconsulting.com.

Robert Green is an industry consultant, author, and speaker located in Atlanta, Georgia. Green obtained his mechanical engineering degree from the Georgia Institute of Technology and has used Autodesk products since 1985.

What's In Your Future?



customer to vendors, supplier to customer, etc., as the paramount goal for collaboration. In plain language, the ability to keep your information in a single file format and have other computer tools work with that data will provide the best basis for future collaboration and PLM technologies no matter what they may be.

Conclusion Five: Since nobody knows how collaborative or PLM systems will evolve and solidify, your best bet is to work with technology platforms that are industry standard because they'll be the systems that collaborate the most due to sheer volume. Autodesk product users are in a great position for the future because of Autodesk's ubiquitous CAD market position.

What does it all mean?

When I returned from COFES and tried to collect all my thoughts for this article it became clear to me that the future for CAD



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Autodesk Revit: A Fresh Approach to BIM

» As the AEC industry takes a closer look at Building Information Modeling (BIM), Revit is poised to capture new market share. Here's a look at what sets Revit apart from its competitors

After decades of being dominated by 2D CAD technology that reduces building representations to dumb graphic entities and leads to inconsistent drawings, coordination nightmares, and expensive errors during construction, the AEC industry is taking a serious look at Building Information Modeling (BIM). With BIM, a building is represented by intelligent components that are aware of themselves and their relationship to other objects. This leads to many potential benefits such as ease of creating and editing a building model, the ability to automatically derive 2D documentation, better accuracy and consistency, the ability to detect conflicts between components, the capability to automate analyses such as energy, code-checking, fire egress, cost estimation, and so on.

The concept behind BIM is not that new. Object-oriented, AEC-specific, 3D modeling solutions such as Autodesk Architectural Desktop, ArchiCAD,

Architecture for MicroStation Triforma (now known as Bentley Architecture), and VectorWorks ARCHITECT have been

Building Information Modeling. Subsequently, competing vendors such as Bentley and Graphisoft also agreed to use the term BIM to describe their building modeling solutions; Nemetschek NA recently jumped into the fray as well. All these vendors have been aggressively marketing their respective BIM solutions, and

AEC professionals are being forced to sit up and take notice.

Autodesk Revit is the newest application of the pack. Built from the ground up with a centralized building data model, intelligent building objects, sophisticated parametric technology, and the latest programming concepts, Revit presents a fresh approach to BIM. This article describes some of the key revolutionary aspects of Revit's technology that distinguish it from its competitors. (Currently in release 5.1, version 6 of Revit is expected to be released soon.)

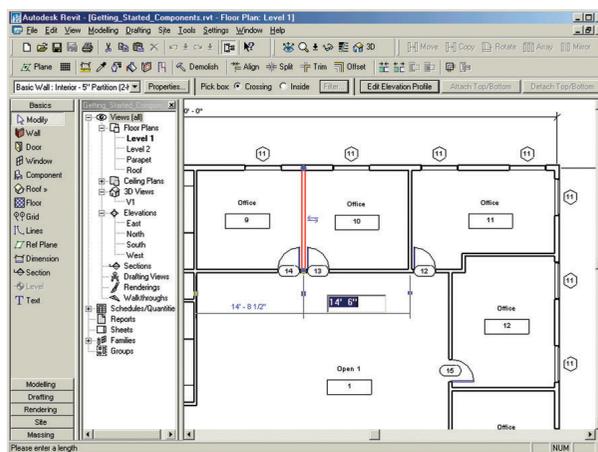


Figure 1

around for some time. The recent aggressive push for BIM adoption can be attributed in large part to the acquisition of Revit Technology Corporation by Autodesk in April 2002, and its labeling of Revit's parametric building modeling technology as

Minimal and Intuitive Interface

An application's ease of use is going to be one of the key factors in BIM adoption. Professionals have spent decades mastering

the complexities of CAD applications; they aren't going to be motivated to switch to a BIM application unless it's relatively easier to learn and use. Revit has a definite edge on that score. Following modern user interface design concepts, Revit's interface is simple, minimal, and clean, as shown in Figure 1, with most of the screen space devoted to the drawing area. All the tools for modeling the various building components, drawing drafting elements, and setting up rendering parameters are contained in a single Design Bar located on the left of the window. There is only one floating palette, which is the Project Browser that provides quick access to all the views, reports, schedules, sheets, and so on that are defined for the project. The Project Browser is docked next to the Design Bar in the default layout.

Starting a new project is easy—you just plunge right in. If you want to start with walls, for instance, select the Wall tool from the Design Bar, choose from a variety of modes such as rectangle, circle, arc, multiple connected lines, etc., and start drawing, either in a 2D floor plan view or in a 3D view, which you select from the Project Browser. The Browser already contains basic predefined views such as floor plans, ceiling plans, and elevations, and you can quickly add a default 3D view as well. If you choose to draw in a plan view, you will still be entering 3D graphical information and other data about the wall, as you can verify in the 3D, elevation, or section views. You can modify the default wall type and properties such as height either before you start creating the wall or after you have created it. Depending upon the wall type and associated thickness, the wall is modeled with the correct width, and the joints are automatically cleaned up. Tools for creating other building elements such as doors, windows, stairs, and

columns work in a similar fashion and are relatively simple to use. Elements such as floors and roofs, referred to as "hosts" in Revit, are created in a sketch mode by drawing lines or selecting walls, and specifying slopes and other properties.

Interactive Dimension Display

What makes drawing in Revit particularly easy is that the dimensions of an object are displayed interactively as you are drawing it. If you type a dimension using the key-

board, this overwrites the displayed dimension and sizes the object according to the value you have entered. When an object is selected, its dimensional relationships with neighboring objects are conveniently displayed and can be again be interactively edited (see Figure 1); they get automatically updated if the object is moved. Snapping is always on, and quickly locates endpoints, and center lines of existing components.

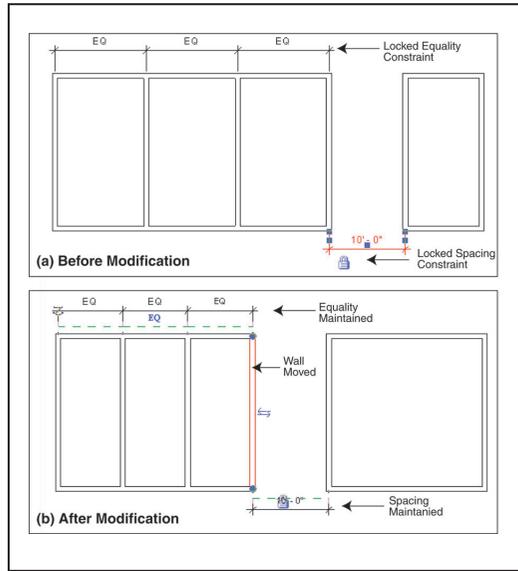


Figure 2

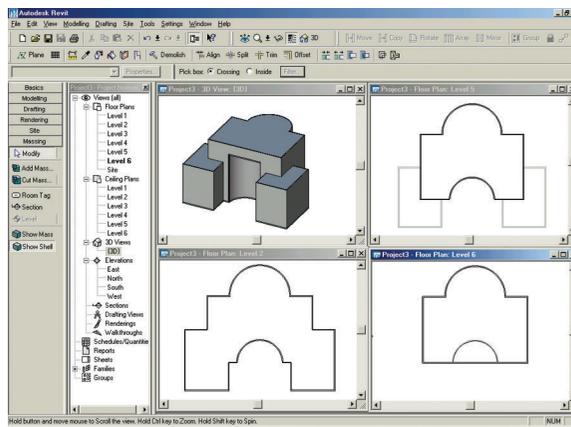


Figure 3

With this innovative style of dimension display and input, accurate models can be created without the rigmarole of absolute and relative coordinates. Revit, in fact, does not even have a coordinate system with an origin and the X, Y, and Z axes, and it comes as a pleasant surprise to find that you don't really need them for modeling a building, given the right interface.

Automated Change Management

Once the building components are in

place in a Revit model, you can see it from any view—in plan view by floor levels, vertically by elevations, in 3D by using a 3D view, or tabularly in lists such as door or room schedules. You can also create section lines to automatically derive building sections as required. All these disparate views are of the same building database or model, which means that they are always synchronized. Since the drawing set in Revit is completely integrated into the model, all the construction documents are also always consistent.

Revit's powerful parametric change engine ensures that this consistency is maintained even when modifications are made. Any change that is affected in any view has a rippling effect: all plans, sections, elevations, 3D views, and schedules automatically update to reflect the change. No recalculation is involved, and no buttons need to be clicked to show the changes, as in other BIM solutions. In Revit, you only see the most up-to-date view at all times.

Predefined and Custom Relationships

Not only does Revit automatically update modifications in all views to reflect consistency, it goes a step further and also maintains the relationships between all building components affected by the change. This ability extends to both predefined relationships as well as custom relationships that you specify. Predefined relationships are those built-in between building components. For instance, moving a wall will automatically move any openings it contains, and stretch the adjoining walls as well as reconfigure the floor and roof slabs so as to maintain their connectivity with the wall being moved. If any components such as furniture or fixtures have been placed against the wall with an association option checked in their Properties dialogs, these move along with the wall to maintain that association.

Custom relationships such as dimensional constraints, alignments, and attachments between components can also be defined and are maintained when modifications are made. To set up a dimensional constraint, all you need to do is add a dimension to an element or to the spacing between elements, and designate that dimension as locked by clicking on its accompany lock icon (see Figure 2). The locked dimension will now be unaffected

when modifications are made to neighboring and related elements. Similarly, you can create an alignment relationship between elements and lock it. The same ability is also useful for creating an attachment relationship between building components for which built-in relationships do not exist, such as a wall and a column.

The ability to define and maintain such custom relationships in addition to built-in relationships between building components are at the heart of Revit's "next generation" parametric technology that sets it apart from its competitors. It can go a long way towards enhancing efficiency and productivity while designing and documenting buildings. In my assessment, the capturing of critical building relationship information is fundamental to smarter building modeling and rates as one of the top criteria for evaluating BIM solutions.

No Layers!

Autodesk Revit is unique among BIM solutions in going to great lengths to not be like CAD. To that end, it does not even have layers, that traditional hallmark feature of most CAD systems. Revit innovatively eliminates the need for layers by automatically organizing building elements in the model according to their type—or category—such as doors, walls, columns, floors, electrical fixtures, and so on. To selectively see only the required element types in any view, you can turn off the visibility of the other categories for that view. There is also a tool that lets you temporarily hide or isolate selected elements, irrespective of category.

Manipulating the visibility of separate component categories, does not, however, work globally across all views, and long-time CAD users might miss the flexibility of organizing any element types by layer as desired, and controlling their visibility and modifiability. But considering the management hassles involved in enforcing layering standards, the absence of layers can also be seen as a welcome relief. Categorizing objects automatically by type, as Revit does, is entirely logical in an application that deals with smart objects rather than dumb graphic entities. It leaves the user with more time to concentrate on the design rather than worry about on what layer to create objects.

Building Shell from Massing Model

In addition to its ability to create a detailed building information model for the later phases of building design, develop-

Revit's fresh approach to BIM has the application doing more of the tedious and repetitive work, freeing up the user to concentrate on design tasks



ment, and documentation, Autodesk Revit can also be used for the conceptual phase of building design to carry out 3D massing studies. For this, it has a dedicated massing module that allows you to quickly create a massing model by adding and subtracting volumes. Individual volumes can be created by using one of four operations: Extrude, Revolve, Sweep, or Blend. While the massing capabilities are not as well developed as those in dedicated 3D modeling applications, they are sufficient to create massing models of reasonable complexity.

Once you have developed a massing model that seems satisfactory, you can add any additional levels to the project in addition to the default two levels. Revit automatically creates a building shell—complete with semantically intelligent wall, roof, and floor objects—that corresponds with the massing model. This means that once you create the massing model, you also have the external wall boundary at each level of the building (see Figure 3), and you can go ahead and start developing its internal layout. Thus the concepts

developed during massing studies can actually help jump-start the detailed design process.

Conclusions

This article by no means represents a critical review of Autodesk Revit or even a complete overview of the application. The intent was to highlight the defining features that set Revit apart from its competitors in the context of Building Information Modeling (BIM): a streamlined, modern interface with several smarts that simplify the creation and editing of building entities; automatic change management capability that immediately synchronizes all graphical and tabular views of a building when a change is made, resulting in a geometrically consistent and accurate model; intelligent built-in relationships between building components as well as the ability to define custom relationships and dimensional constraints that are maintained even when modifications are made; elimination of archaic features such as layers and the concomitant management hassles; and support for conceptual design in the form of a massing model from which the building shell can automatically be derived.

Revit's fresh approach to BIM has the application doing more of the tedious and repetitive work, freeing up the user to concentrate on design tasks. The computer then becomes what it should have been all along—a more intelligent design medium, rather than simply a means to document a design that has been worked out on paper.

As they say, however, the proof is in the pudding, and it remains to be seen whether the revolutionary features of Revit are enticing enough to motivate AEC professionals to make the leap from CAD to BIM. Being relatively new, Revit's success can only be gauged after widespread adoption and real-world implementation on large projects. If it does succeed, it would have undeniably raised the state of the art in building modeling to a new high.



Lachmi Khemlani has a Ph.D. from UC Berkeley specializing in architectural CAD and continues to write, research, train, and consult in this field. Her Ph.D. thesis was on intelligent building modeling. She writes regularly on CAD and AEC technology in industry publications and has a new book, form-Z 4: 3D Modeling, Rendering, and Animation (McGraw-Hill). She can be reached at lachmi@arcwiz.com.

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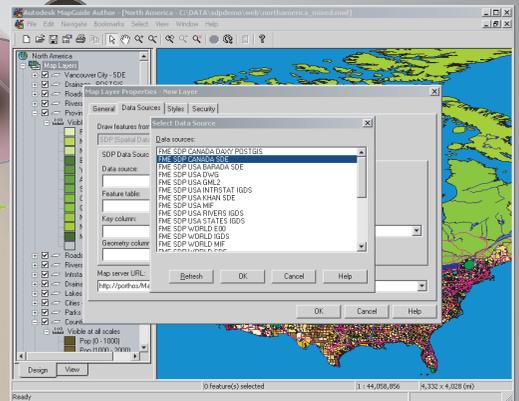
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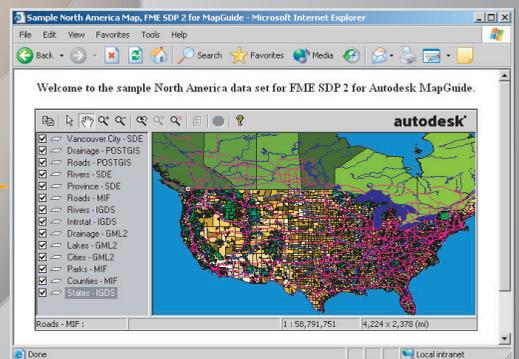
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Entities vs. Objects

Have you ever wanted to learn to use Active-x functions with Visual LISP?

I know that there are a lot of AutoCAD operators out there that have learned and used a little AutoLISP, but most have been a little intimidated by the new Visual LISP and Active-x commands. With traditional AutoLISP most of the manipulation of graphic objects has been done with either the COMMAND function or using the entity functions, including ENTDEL, ENTGET, ENTLAST, ENTMAKE, ENTMAKE, ENTMOD, ENTSEL, and ENTUPD.

If you are not familiar with these functions then I would suggest you start by looking up ENTLAST, ENTGET, ENTMOD, and ENTSEL in the Visual LISP editor (AutoCAD command VLIDE) HELP. They are the most common entity functions I use.

I will present two examples that change a selected graphic object to layer "0". This can also be accomplished using the command function similar to: `(command "change" pause "" "p" "la" "0" "")`, but for our discussion I'll focus



on using entity functions and later Active-x functions.

The first example is CLI.LSP.

We start by defining the command "C:CLI" with two local variables. A local variable means that the variable will reset to nil after the program ends and no other running programs can modify or evaluate them. ENAM is the entity name of the selected graphic object and ELST is the entity list of that graphic object. The "C:" in the DEFUN (define function) statement makes the command available at the Command line and does not refer the C: drive.

```
(defun C:CL1 (/ ELST ENAM)
```

Using the ENTSEL function, which will prompt the user to "Select graphic object:" and after the user selects a graphic object will return a list of two items. The list includes the entity name and the selection point, and looks like:

```
("<Entity name: 410cbca8> (10191.8
```

```
14233.9 0.0))." The first part or CAR of the pair we set to the ENAM variable. If you would like to learn more about CAR, and CDR I would suggest you look them up in the VLIDE HELP.
```

```
(setq ENAM (car (entsel "\nSelect graphic object:")))
```

We next set the variable ELST to be the entity list using the ENTGET function.

```
(setq ELST (entget ENAM))
```

An entity list is a list of dotted pairs and short lists that each include a DXF code, and specific information about the entity.

I included an example list for discussion, it is a LINE drawn in "Model" space on the "DIM" layer from point (10195.3 14251.8 0.0) to point (10195.3 14194.7 0.0).

```
("(-1 . <Entity name: 410cbca8>) (0 . "LINE") (330 . <Entity name: 40091cf8>) (5 . "30C9D") (100 . "AcDbEntity") (67 . 0)
```

```
(410 . Model") (8 . "DIM") (100 . "AcDbLine") (10 10195.3 14251.8 0.0) (11 10195.3 14194.7 0.0) (210 0.0 0.0 1.0))"
```

In the next line I want to substitute the layer "0" into the entity list. DXF 8 is the layer DXF code I want to change. To do this I first make a dotted pair using the CONS function (cons 8 "0") which returns (8 . "0"). The (assoc 8 ELST) will return the pair (8 . "DIM") from the 8 DXF code in the entity list. The SUBST function will switch the new pair for the old pair in the entity list.

```
(setq ELST (subst (cons 8 "0") (assoc 8 ELST) ELST))
```

The entity list has been changed, but I still need to modify the graphic object on the screen. For this I use the ENTMOD function.

```
(entmod ELST)
```

```
)
```

End program CLI.LSP

With the introduction of Visual LISP there are now more than 1,000 new commands to manipulate graphic objects. That might seem a bit overwhelming, but you don't have to learn them all at once. I would like to share with you an example of accomplishing the same thing as the previous example, except with Active-x functions.

We start by defining the command CL2 with two local variables, ENAM is the enti-

type name of the selected graphic object and OBJ is the object pointer to that graphic object. Object pointers or “objects” are encapsulated properties and methods. For example: a property might be the “layer” of the object, and a method might be to “copy” an object.

```
(defun C:CL2 (/ ENAM OBJ )
```

In order to use the Active x controls, you must load the functions into memory. The (vl-load-com) command needs only be run once within an editing session. If you run it more than once it will disregard itself. I would recommend using it in all programs that include Active-x commands.

```
(vl-load-com)
```

Just as the previous example, we prompt the user to select a graphic object, and get the entity name ENAM.

```
(setq ENAM (car (entsel
"\nSelect graphic object:
")))
```

Here is where we convert the entity name into an Active-x object with the variable name OBJ.

```
(setq OBJ (vlax-ename->vla-object ENAM))
```

To view the properties and methods for the object OBJ we use the (vlax-dump-object <Active-x object> 'T) function.

```
(vlax-dump-object OBJ 'T)
```

The listing in the text screen will look like:

```
; IAcadLine: AutoCAD Line Interface
; Property values:
; Angle (RO) = 4.71239
; Application (RO) = #<VLA-OBJECT IAcadApplication 00a88728>
; Color = 256
; Delta (RO) = (0.0 -57.0833 0.0)
; Document (RO) = #<VLA-OBJECT IAcadDocument 00f152dc>
; EndPoint = (10195.3 14194.7 0.0)
; Handle (RO) = "30C9D"
; HasExtensionDictionary (RO) = 0
; Hyperlinks (RO) = #<VLA-OBJECT IAcadHyperlinks 069c12c4>
; Layer = "DIM"
; Length (RO) = 57.0833
; Linetype = "ByLayer"
; LinetypeScale = 1.0
; Lineweight = -1
; Normal = (0.0 0.0 1.0)
; ObjectID (RO) = 1091353768
; ObjectName (RO) = "AcDbLine"
; OwnerID (RO) = 1074339064
; PlotStyleName = "ByLayer"
; StartPoint = (10195.3 14251.8 0.0)
; Thickness = 0.0
```

```
; Visible = -1
; Methods supported:
; ArrayPolar (3)
; ArrayRectangular (6)
; Copy ()
; Delete ()
; GetBoundingBox (2)
; GetExtensionDictionary ()
; GetXData (3)
; Highlight (1)
; IntersectWith (2)
; Mirror (2)
; Mirror3D (3)
; Move (2)
; Offset (1)
; Rotate (2)
; Rotate3D (3)
; ScaleEntity (2)
; SetXData (2)
; TransformBy (1)
; Update ()
T
```

With the introduction of Visual LISP there are now more than 1,000 new commands to manipulate graphic objects

Notice that this is the same “LINE” that we used in the first example. The properties and methods are fairly self-explanatory. You can explore and play with them. The one we are interested in for this example is the layer property. If I wanted to get the layer property from the OBJ object I could use one or the other of these functions (vla-get-layer OBJ) or (vlax-get-property OBJ “layer”). They are functionally equivalent. Similarly, there are two functions for invoking methods like (vla-copy OBJ) or (vlax-invoke-method OBJ “copy”). In order to put information into the object I have two options (vla-put-layer “OBJ” “0”) or (vlax-put-property “OBJ” “layer” “0”).

So for our example we put the layer property to be the layer “0”

```
(vla-put-layer OBJ "0")
)
```

```
End program CL2.LSP
```

You can cut and paste the programs into a text file, called CLI.LSP and CL2.LSP. I am representing them without the comments.

Since you can have more than one equality inside a setq statement I am going to combine the three setq’s in the examples for clarity.

```
(defun C:CL1 (/ ELST ENAM )
  (setq ENAM (car (entsel
"\nSelect graphic object:
")))
```

```
      ELST (entget ENAM)
```

```
      ELST (subst (cons 8
"0") (assoc 8 ELST) ELST)
```

```
)
```

```
(entmod ELST)
```

```
)
```

```
(defun C:CL2 (/ ENAM OBJ )
```

```
(vl-load-com)
```

```
(setq ENAM (car (entsel
"\nSelect graphic object:
")))
```

```
      OBJ (vlax-ename->vla-object ENAM)
```

```
)
```

```
(vlax-dump-object OBJ 'T)
```

```
(vla-put-layer OBJ "0")
```

```
)
```

Cut and paste these programs directly into the command line of AutoCAD or into ASCII text files named CLI.LSP and CL2.LSP and save them into a directory within the files search path. Then at the command line within AutoCAD type (load “CLI”) and (load “CL2”).

You can then run them by typing CLI, or CL2 at the command line.

That’s enough for one lesson. I hope this encourages your future exploration of Visual LISP.

Peter Jamtgaard, an 18-year veteran AutoCAD operator, programmer, and developer, is the engineering and CAD manager for Cordeck Sales, Inc. in Kenosha Wisconsin. He is a member of the AUGI Board of Directors, the AUGI Programmers Industry Group chairman, and an active participant in the AUGI LISP Guild.



A “Non-Surveyor’s” Surveying LISP Routine

Working in the drafting world over the years has taken me to areas where I might not always have been comfortable. Surveyor’s units and direction have always caused me to scratch my head and double check to see if I got a distance and angle going the right direction. I finally wrote a short LISP routine that would keep me from scratching my head so much. It will put the distance and the angle on a line with surveyor units.

Using this LISP routine does not force me to set my units to either decimal or surveyor units. I can leave them to my template’s default if I wish. This routine will put the desired text on my lines in the correct format for placing distance and angle information on a lot layout, for example, without making me do anything else.

With a lot layout in my drawing I can just start on one corner and work my way clockwise around the lot. I label each line by picking the end points of the line and then just placing the text. I usually pick a place near the center of the line to place the text. When working around the boundary, some text may show up almost upside down. I just use the Rotate command to rotate it 180 degrees to view it better.

The first thing the routine does is to get the current OSNAP setting and save it. Then it sets the OSNAP to “endpoint” for you. Next it prompts you to pick the two points for the measurement. This routine will then put the distance value into a unit format for decimal feet with two decimal places. The angle format is put into surveyor units with a precision currently set to 2 for degrees and minutes. By changing the line “(angtos A 4 2)” to “(angtos A 4 4)” you can get degrees, minutes, and seconds.

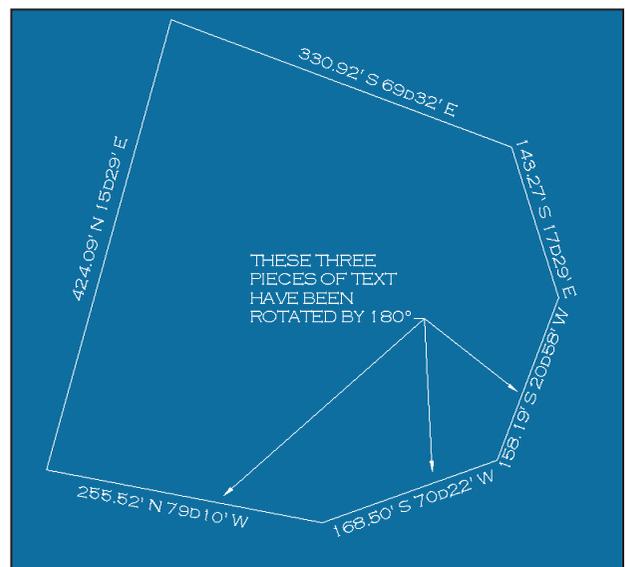
Okay, so I might have to increase my TEXTSIZE value for the text to appear properly, but I can handle that. The line

with the comment “;text command” sets the text size to 8 units. Just by changing this number I can change my text size for the routine.

The last thing the routine does is reset the OSNAP mode back to the original value. Phil Kreiker, a great LISP instructor, taught me that in LISP as well as life: “When you take something – put it back!”

This simple little routine can be a life-saver for those of us that believe in angles as they were laid out on a protractor. Ever wonder where those folks who went into surveying were that day in geometry when we studied the protractor?

Donnia Tabor-Hanson (donnia.tabor-hanson@augi.com) is AUGI’s Logistic Liaison and an Autodesk Authorized Consultant. She is a frequent contributor to PaperSpace.



Here is the LISP routine:

```
;Donnia M. Tabor-Hanson, Mar. 9, 1998 *
;This program will allow the user to pick the end points of a *
;line to get printout of the line’s length and distance. *
;Currently it is set to decimal length and surveyors angles. *
;A little manipulation of the routine will allow any type of units *
;to be used. *
```

```
(defun C:TA ()
  (setq CO (getvar "OSMODE")) ;get the current value of osnap
  (setvar "OSMODE" 1) ;sets osnap to endpoint
  (setq P1 (getpoint "\nSelect first endpoint of line: "))
  (setq P2 (getpoint "\nSelect other endpoint of line: "))
  (setq D (distance P1 P2)) ;sets the value of the distance
  (setq DI (rtos D 2 2)) ;changes to a string-2 decimal places
  (setq A (angle P1 P2)) ;defines the angle between pickpoints
  (setq ANG (* A (/ 180 pi))) ;converts the points angle for input
  (setq ANT (angtos A 4 2)) ;converts angle information to text
  (setvar "OSMODE" 0) ;sets osnap to NONE
  (command "TEXT" "C" pause "8" ANG (strcat DI " " " " ANT)) ;text command
  (setvar "OSMODE" CO) ;resets osnap to original setting
);defun
```

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Making AutoCAD Scream!

Okay...were this article written in two parts...the first would start with key advice on **defrag** and **disk cleanup**, perhaps including a step-by-step of the how-to's and why's. However, in today's demanding environments, this is considered old school advice. Most people know it. If I advise to install antivirus and firewall, may I also indicate that such is not nearly enough?

Sure, you can find sage advice to garner that 3GHz super machine, with the 3GBs of RAM and twin RADEON 256MB cards wired to twin 27" flat screens. Maybe you will find similar sage advice to keep your software and operating system contemporary, study the documentation, and learn the advanced, novel ways to expand your potential with new behavior.

Still, your system will bog down with improper behaviors. Techniques of keeping a fine machine tuned change with fluid technologies. The old school methods, though valid, are small help when faced with today's invaders. Do you know the many creatures that could be gobbling your resources? Can your savvy sense an invader, though it lurks silently and unannounced?

It is time to know the new culprits, find them, eradicate them, and learn to avoid behaviors that lead to their return.

Before we get too far, you should know that a hard drive approaching half-full starts to seriously bog down your system. You are pushing the capacity of the system to efficiently locate files and store new or temporary ones. All facets of regular maintenance start to slow. This includes virus detection. So, if you must have the latest games and a multitude of toys, you could substantially be getting in your own way.

I choose, actually, to reformat my hard drive about every nine months after the first year. Witness here the firm caveat to back-up needed files. Once you take the time to reinstall a multitude of little gadgets, you'd be surprised at how many you can do without. Often, it is recommended that AutoCAD only be installed upon a newly reformatted hard drive. In short, a cleaner hard drive performs better. Shorter addresses, shorter searches, and shorter pit stops are necessary for the machine that needs to be screaming.

Control Temp and Autosave files

Having your temporary files and your Autosave files on a network server or cluttered hard drive is a surefire way to slow your AutoCAD experience.

Do you know how to recover your last Autosave manually or even know where it is? Is it on the network? AutoCAD creates temporary files and will clean them if your system does not crash. You could be harboring "spent" temp files and Autosave files from months gone by. Space, my friends, we're talking of serious space on that hard drive. Find it. Recover it. Be the lord of this domain.

In AutoCAD, go to Tools/Options...Under "Files" tab...select "Automatic Save File Location". Using the "Browse" button, seek a folder (you must create it first) called Asave. This will hold your temp files and Autosaves. Autosave files will have the .SV\$ extension and it is important that you know how to rename them if needed. NOTE: you must have the visibility of known file extensions turned on, so in Control Panel/Folder Options/View tab, uncheck "Hide extensions for known file types." Please use this advice responsibly!

If you are convinced that you do not need an Asave (.SV\$) in this folder, you can delete them. If you are certain that AutoCAD is not running, you may delete the entire folder contents. This folder can build incredibly, making your computer work around huge leftovers. Emptying it is a fine way to help restore your machine to lean, mean, and screaming.

Set all cookies to YOUR approval

Who is authorized access to your machine? If you think it's only you, or perhaps network users, think again. Firewalls, though powerful, do not block all cookie acceptance, and some cookies are devious.

First my disclaimer: operating systems differ. My instructions herein are for Windows XP and your machine might differ. Housecleaning requires heads-up for configuration restoration and seamless system functionality. The methods I describe assume you have the knowledge to backup files and identify the tasks you encounter. If you have doubts, seek professional assistance.

Pay attention here! Use Control Panel/Internet Options/Privacy Tab..."Advanced"..."Prompt" for first party cookies and "Block" third party. This will mean you must approve all future cookies. Pop-ups will dwindle. Later, as you surf the Internet you will be asked to "Always Approve" from key sites, "Always Block" others, and keep the rest on prompt only. Annoying, perhaps, but over time it will be

better than simply allowing dirt to get by. It becomes less tedious as culprits are blocked and the worthy always allowed.

While you are here, after OK, click "Edit." If there are any managed sites, select "Remove all" to give yourself a clean slate.

As you approve incomers, be wary. There are both the necessary and the devious coming at you, and wrong moves can shut down the Internet access. When in trouble go back to Control Panel/Internet Options/Privacy/Edit and "Remove all" or edit singularly. This will open doors previously closed by accident.

Do not try "instant web cookies fixers." Using outside software to help doing this simple task invites trouble.

The hunt begins

Spybots! If robots are man-made mechanisms that work independently of the humans around them, then bots are the affectionate term given to programmed mechanisms that work independently of you. Spybots are spies that collect data such as what resources and programs you have and what behaviors you use. Then they report this stuff to agencies elsewhere. They want to know what makes you click. They are generally harmless, but they use resources and they occupy memory. They can also funnel bits of your privacy, such as addresses, phone numbers, and card numbers, to corporations or thieves. They occupy hard drive space, use up clock cycles, and connect to the Internet, with or without your permission. You probably have spybots if:

- You download free shockwave or other online games
- You download music
- You use an email enhancing service such as Hotbar
- You have downloaded a weather reporter such as Weatherbug
- You have downloaded a free Pop-up Stopper
- You use an Internet "expeditor" promising to improve your webpage access
- You use a browser other than standard issue
- You use Kazaa or other desktop Internet assistant
- You use any of a number of children's games and learning toys
- You download a connection to radio or television broadcasts
- You visit pornography websites
- You use AOL or connect to them at all

Assume anything new that you install has a spybot, and be grateful when they don't. Newer versions of Windows Media Player and MSN Messenger include spies.

How do I find and clean out a spybot?

Obtain a few choice eradicators. Some are freely available, such as "Spybot Search and Destroy" and "Ad-Aware." Use more than one, as some will find spybots that others miss. You will be given chances to restore mistaken removals, but those are actually rare. Run the eradicating software programs and follow instructions for "immunizing" or "fixing" discovered culprits. Make a note of the names of the ones identified. Your first run should uncover dozens, if not hundreds. In a short time you will know where these are coming from, and who is spying on you.

Please note that authors of free utilities hope to seek their rightful place as paid servants. You are urged to pay for trusted, professional utilities once you are convinced of the quality they provide.

Those familiar with the MSCONFIG or REGEDIT utilities might also discover additional methods of restricting certain unneeded or unwanted accesses. I seriously advise this for only the most seasoned

users, knowing that serious catastrophe can result without due care. *PCWorld* has a list of certain resource leeches worth quieting. If unsure, seek professional assistance and always remember that extreme caution is required with these utilities.

Still, this is more about YOU!

One must not only clean house with the proper tools and keep vested in current security measures; one needs sensitivity and discipline. You must develop a feel for when systems are bogging down and develop disciplines that resist those free and attractive "Needful Things." Recognize that invaders come from a variety of places. Get to know those places. Run these utilities after any install, know exactly what behaviors you have engaged in that invited them, and stop it!

Games and tricks, even in awesome environments, should exact your tight control. An awesome environment is not an invitation to wanton disregard for the hoops you jump your system through. It becomes last year's model quickly. If you expect AutoCAD to perform impressively, do not lay tiresome traps and fatiguing interventions, unless they are viable and worthy enhancements.

Finally...

The advice of old results from tested

knowledge and remains valid: that awesome machine with the latest features has little value unless supported with three simple concepts.

- **Protection:** Virus, firewall, cookie management
 - **Maintenance:** Disc cleanup, disc management
 - **Saving yourself from you:** Identify and eradicate invaders. Practice behavior that keeps them out.
- Develop the savvy to sense and resolve system slowdown. Make your AutoCAD scream.



Wayne Hillman is AutoCAD Administrator for Medallion homes (www.medallion-home.com) using Autodesk Architectural Desktop 2004. He is a speaker at his local Suncoast AutoCAD User's

Group, and part owner of www.Autocad-Academia.com, an international online user's group. He has used AutoCAD and AutoLISP since 1988 (Release 2.6). His disciplines include electrical, structural, mechanical, and civil engineering, as well as architecture, and he has led or joined design teams for Malls, Schools and Universities, Bridges, Hospitals, Jails, and hundreds of Southwest Florida homes.

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What's new ...in the system variables of AutoCAD 2004?



In preparation for updating my topical index of system variables on www.afralisp.com I made a comparison between the AutoCAD 2000i and AutoCAD 2004 releases. By manually comparing the variables in the command reference index of issue 16.0 of AutoCAD 2004 with the command reference index of issue 15.05 of AutoCAD 2000i, I found 39 changes: 38 additions and 1 replacement. `STARTUP` seems to replace `STARTUP-TODAY` since the `TODAY` screen in AutoCAD 2000i has been removed.

The 38 additions are listed alphabetically below with a very brief description. If you wish a complete description, you may go to `Help > Help > Command Reference > System Variables` in AutoCAD 2004 and then select by first letter of the variable of interest. I hope that I will be able to update my topical index on www.afralisp.com soon.

Paul Levine, an active participant on AUGI's Guilds, pointed out another source of system variable names within the AutoCAD software. To display the first page of the system variables arranged alphabetically, enter `setvar` at the command line. Then enter a question mark to request a list, followed by an asterisk as a wildcard to indicate "all." To see the remainder of the pages displayed, continue to press the Enter key for each page. This method yielded some that were not shown in the command reference index. These will be listed below as not documented in AutoCAD 2004. It is interesting to note

that `getvar` does not produce the list but `setvar` even lists the read only variables, which cannot be changed by users.

1. `ADCSTATE` is to be used by AutoLISP developers to determine if the Design Center is active (0 or 1) read only.
2. `DIMASSOC` controls the associativity of dimension objects (0, 1, 2).
3. `ERRNO` displays the appropriate number of error code for AutoLISP functions.

It is interesting to note that `getvar` does not produce the list but `setvar` even lists the read only variables, which cannot be changed by users.

Gradient related

4. `GFANG` specifies the angle of a gradient fill (0 to 360).
5. `GFCLR1` specifies the color of the first gradient fill.

6. `GFCLR2` specifies the color of the second gradient fill.
7. `GFCLR1LUM` adjusts the color of a one color gradient.
8. `GFCLRSTATE` specifies one or two colors for gradient fill (0, 1).
9. `GFNAME` specifies the pattern for a gradient fill (1 to 9).
10. `GFSHIFT` specifies if the gradient is center or shifted (0, 1).

Grips related

11. `GRIPHOVER` controls the color of fill of a grip (0 to 255).
12. `GRIPOBJLIMIT` suppresses the display of grips on very large selection sets.
13. `GRIPTIPS` controls display of grip tips under certain conditions (0,1).

Miscellaneous

14. `HALOGAP` specifies the gap when one object is hidden by another.
15. `HIDETEXT` controls hide of text when `HIDE` command is issued.
16. `HPASSOC` controls if hatch patterns and gradient fills are associative.
17. `INTERSECTIONCOLOR` controls the color of intersection polylines.
18. `INTERSECTIONDISPLAY` controls the display of intersection polylines.
19. `LOCALROOTPREFIX` stores full path to the root folder.

Multi-line text editor related

20. `MTEXTED` sets the application to use in editing multiline text.

21. MTEXTFIXED controls the appearance of the multiline text editor.
22. MTJIGSTRING sets the sample text content.
23. MYDOCUMENTSPREFIX stores full path to user's My Document folder.

Obscured lines related

24. OBSCUREDOLOR specifies color of obscured lines.
25. OBSCUREDTYPE specifies line type of obscured lines.
26. PALETTEOPAQUE controls transparency of windows.
27. PEDITACCEPT suppresses display of non-polyline objects.
28. PELLIPSE controls creation of an ellipse.
29. REPORTERROR controls if report is sent to Autodesk for unexpected closure.
30. ROAMABLEROOTPREFIX stores full path to root directory of romables.
31. SIGWARN warns if file with digital signature is open.
32. STANDARDSVIOLATION warns user of standards violation.

33. TPSTATE controls display of tool palette window.
34. TRAYICONS controls display of tray on status bar.
35. TRAYNOTIFY controls display of service icons in tray on status bar.
36. TRAYTIMEOUT controls time service icons are displayed.
37. WHIPTHREAD controls the use of additional processors to increase speed.
38. XREFNOTIFY controls notification of update or missing xrefs.

I found a few variables that were not mentioned in the list generated by the setvar command but were in the command reference index; notable among them were the USER* series. These will not be listed in the "not documented" group since the command reference index will be considered the master, which should provide sufficient documentation. However, I also found a few variables in the list generated by the setvar command which were not documented in the command reference

index and I have listed those below.

Not documented in Command Reference-System Variables in AutoCAD 2004 Help Section:

CLEANSCREENSTATE ? (The default value is 0).

CMDDIA controls the display of dialog boxes for the PLOT command.

PSPROLOG assigns a name for a prolog section to be read from the acad.psf file when you use the PSOUT command.

PSQUALITY controls the rendering quality of PostScript images and whether they are drawn as filled objects or as outlines.



Gil Hoellerich (ghoellerich@NC.RR.com) has a BSEE from Missouri University. After 30 years of telephone experience, he retired from Bell Lab to teach math, computer subjects, and AutoCAD in post-secondary schools in Arkansas. Since retiring from teaching he has retained his interest in AutoCAD and computers. Gil has written for PaperSpace in the past.



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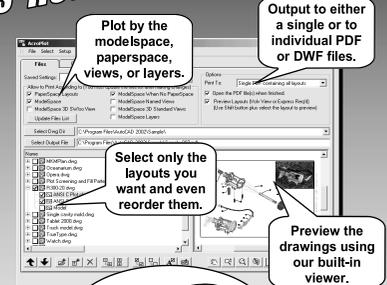
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I created a free, public domain website in 1995 containing a library of AutoCAD of drawings and construction specification details. My organization, the U.S. Forest Service (USFS) Region 6 (Oregon and Washington), located in Portland, Oregon, deals with USFS facilities construction projects in Oregon and Washington.

I created this website (<http://www.fs.fed.us/database/acad>) before most engineers could spell WWW. The intent was to share drawings with our field offices and consultants who work with us. We deal with small-scale projects for roads, recreation, facilities, parks, electrical, civil drawings, water, and sanitation. Many of these drawings are older—dating back 10 years or so, but are a source for people looking for small-scale project details.

We are constantly adding drawings to this library for our field engineers in the USFS nationwide to use. Many other federal agencies have also used our details.

We have created PDF files for an online preview of many of the drawings so you don't have to download them to view them, making it easy to browse our library. This PDF conversion process continues. The standards in which these drawings were done originally vary widely, but they are usable for many applications.

Engineers from all over the world have used these details, but we have not done any advertising of this resource. Our disclaimer is that the user must accept liability for any use and meeting current codes and local standards, as the drawings come from a variety of older projects. Our site attracts about 500-1,000 visits per month.

We also link to the BLM, Bureau of Land Management WWW CAD website at www.blm.gov. It also offers drawings and specifications for small-scale projects.

We do large-scale conversions of our old hardcopy project drawings, which go back over 75 years, drawn long before AutoCAD existed. We have our drawings scanned commercially for \$1.50 per sheet for a 24"x36" sheet at a local scanning company. We then convert them into AutoCAD format with a program called Draftsman 2000 by Arbor Image.

We have done thousands of drawings in the last decade. We have about 20,000 hardcopy drawings to scan and convert into AutoCAD format. This program on a fast 2GHz processor will convert a scanned "D" size drawing, 24"x36".tif file to dxf format in about 40 seconds. It is completely automated and runs in a batch mode. We convert hundreds of drawings at a time with no operator input required. I have written a document describing this process located at: http://www.fs.fed.us/database/acad/scan/tif_scanning.doc. It some sample drawings and scanning instructions.

Note the DAPS scanning agency mentioned is available only to federal agencies internally, but there are many commercial firms who can do the source scanning.



Steve Sichau is regional electrical engineer for the U.S. Forest Service Region 6 (Oregon and Washington).

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Back In The Day



David Kingsley

Email, the Good, the Bad, and the Ugly

In this issue I am dedicating my column space to informing you about the new forum technology we have introduced on the new augi.com. But first, my personal observations.

I don't think email is half the tool it used to be. I think you know what I mean. My general rule of thumb is that if a tool requires more time to maintain it than it does to use it, it is no longer useful. Recently I seem to be paying too much attention to spam blocking. Too often I cannot sort out that which I want from that which gets trashed. While cleaning out what manages to get to my inbox, I see spam telling me how I can advertise to (spam) three billion people for \$29. Most things I read tell me that spam blocking is a futile effort.

Let us in, please?

We are beginning to see spam blocking as an impediment to augi.com. It is becoming difficult for the AUGI team to communicate with members because we hit their firewalls. Please take a minute to change your settings and allow email from augi.com to get through. If you use a company email system, please ask your IT people to make that change for you.

A funny thing happened on the way to the forum...

There are several reasons for transforming the AUGI Guilds into the Forums. I would like to share with you what the Board of Directors has learned in this regard during 2003. AUGI is relying more and more on sponsorship funding to provide the web services we deliver to our members. In order to entice sponsors, we need to prove that we have lots of new and repeat website traffic. Our two largest draws, the Guilds and ATP courses, required people to pass through the AUGI site only once upon joining. After that, everything was conducted off the website via email. Our research showed that repeat website visits were very low. We had to find a way to get people to come back to augi.com over and over.

There are many barriers to entry for a Guild. To participate, it was necessary to

join AUGI, but most members never understood that there was an additional process required to join a Guild. Furthermore, after joining the Guild there was a follow-up verification process. We know from web records that most of the people that started this process did not complete it. There is no way to know how many people found the whole process intimidating and never attempted. In mid 2003, less than 4 percent of AUGI's 45,000 members belonged to a Guild.



When people did follow through, they were immediately met with a few dozen Guild emails a day. Initially, we were proud of the fact that we had created a support system where people could submit a question via email and get several responses within minutes. We discovered that Guilds tended to top out at about 500 members. Eventually we discovered that as a Guild grew in size and activity, for many of its members the burden of email management became too large a price to pay for an occasional quick answer. To quote Yogi Berra, "Nobody goes there anymore because it's too crowded!"

In the Guild email-based system, group knowledge was distributed, but only to the relatively few Guild members. The Guild knowledge base was transient; it was never captured or indexed in any way. There was no way for members to retrieve information from it. It only existed in personal email logs around the planet. When a new member joined, they would often submit several "frequently asked questions." Veteran Guild members would dutifully and politely answer them, but it was evident that an FAQ system was necessary.

In early 2003, we exceeded the capacity of our email server. Because of the urgency

surrounding the breakdown and the nature of commercial email services available to us, it was necessary to take a large step up in capacity and cost. Shortly afterward we carefully analyzed our situation. We were now paying for excess email capacity, but by its nature, the Guild system we used it for might never take advantage of it.

We also have labored under the belief that many AUGI members relied solely on email to communicate while at work. A recent survey conducted via email to all AUGI members revealed that the second most desired feature for our new website is a *web-based* peer-to-peer support system and knowledge base.

AUGI.COM 2004

When we created the design spec for the new site, we incorporated forum technology as an upgrade for the Guilds. We had observed it being used with success in other large user group environments. Individual board members also used it as active members in those communities. The benefits read like a laundry list of solutions to our problems.

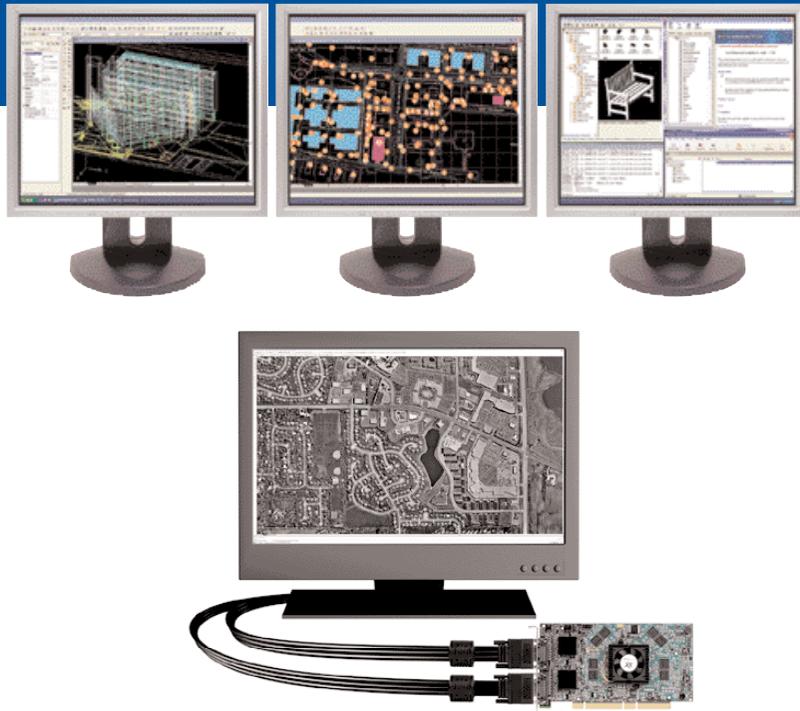
Simply put, the Forums are a well-designed user interface to a database. Every time you post a topic or a reply, you are adding a new "record" to the database. Because the discussions are captured in the database, anybody (providing they are an AUGI member) can search it for stored information. The more people use it, the richer the knowledge base becomes, and the more valuable the resource.

If you really like the email interface of the Guilds, you can set up the Forums to imitate it. You can "subscribe" to a Forum, and it will email every Forum post to you. You can even subscribe to individual threads, so that the only email you get are the answers to your question or various discussions of your choice.

AUGI's near term goal

One of AUGI's goals for the new site is to make it easier for more members to use our peer-to-peer support system. We want to build the new Forum population to many times the size of the Guilds. We believe that the Forums are the logical evolutionary progression of the Guilds. We hope you find that to be true in the coming months.

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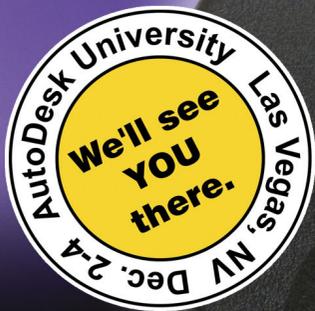
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