Panel: CIMS / CTP

(Transcribed)

Chair: William J. Ray – Group Info Tech, Inc.
Panel Members: Leigh Kimmelman / Udi Arieli / Andrew Watson

Bill Ray: The purpose of these sessions is to insert new ideas into the dialog here at the Annual Technical Conference with the purpose of stimulating new areas of research and debate.

Our panel members are Leigh Kimmelman from Scitex Corporation, who will give us our annual update on CTP issues; Udi Arieli from AHP Systems, who will give us an introduction on the power of operations research in planning press room activities; and, courtesy of Jim Harvery of GCA, Andrew Watson of the Object Management Group (OMG).

Leigh Kimmelman is an old friend, a long time member of TAGA, and gives us our annual update on the CTP wars.

Leigh Kimmelman
My name is Leigh Kimmelman. I am part of the product marketing group at Scitex where my specialties are, believe it or not, computer to plate technology, our screening technology as well as our digital imposition. Basically I am going to spend a few minutes today talking about computer integrated manufacturing and computer to plate technology. We will find out what happens with the digital data and how that digital data can really impact the press room as well as bindery operations, as you assemble digital data for computer to plate or even a film ready or a plate ready film environment. There is a lot of information there which can be utilized for or be integrated, I should say, into the manufacturing process. The whole idea of full automation is very important. As you are removing operator error, you can really get a much greater efficiency of work flow through the system, so it is important to look at the data and how it can be utilized. The CIP3 initiative cooperation for the integration of pre-press and press is moving along very well right now. There are a lot of tools that are available for pre-press, a number of tools that are available in the press room, and a number of tools that are being developed for the bindery operations. I am

also going to talk about a little of this as we go along. Bill asked me to speak basically for about 5 to 10 minutes about the CIP3 products, the products which really influence your pre-press your press and your post-press operations.

In pre-press you assemble an imposition flack and in that flack you know where the on/off's for the laser bursts go. That's all built into the file itself, and you can do a lot of full automation or fully manual operations when gathering this data depending on which front-end system you have and what its capabilities are. There can be a lot of operator intervention, or there can be very, very little operator intervention. It can be as simple as basically printing Postscript or PDF right to a choosier level device on your desk top and initiating operations all the way through RIPping and trapping proofing; maybe sending to another station. It's very, very easy and very common today for an operator to actually have three or four keystrokes total to produce loose pages proofs, to produce an imposed flack and then, after everything's approved, to produce either the plate or the plate ready film. So as part of the CIP3 initiative in computer integrated manufacturing you are really looking at automation from the pre-press perspective. Then there's the press room, and there's digital ink management; being able to look at the data inside the imposition file and actually doing what I'll call a pixel count and determining how many or what percentage of cyan or magenta or yellow respite colors or whatever, resides in a particular zone on that printing press. and that really very press related we are starting to see a number of products out in the market which will actually allow you to dial in a printing press and determine your ink key settings up front so that your consistency shift to shift to shift or even operator to operator is very consistent. One shop I visited in Arizona they are doing very short run things, they were doing 8 one hour press runs per 8 hour shift, when they incorporated digital ink management they went up to 10 press runs per 8 hour shift. Okay the make-ready went from 450 sheets down to 150 sheets with salable color on the first pull. All because of digital ink management and they do a lot of reprint work and when I was shown the sheet from the press runs I witnessed versus the previous prints, the settings were identical because the press operator was no longer setting the keys he had the digital tools to set the keys and he can fine tune from there if he wants to but for this shop they had two year old Akiyama presses first pull 150 sheets with salable color. It was very impressive. We are also seeing some products coming along for bindery operations of cutting, stitching, and folding. These products really haven't hit the market place yet, but very soon we are going to see a lot of them out there. We are starting to see the hardware manufacturers of bindery equipment Polar, Muller Martini, all create products which support digitally setting cutter depths, folders, stitchers; all of the bindery operations. Again this falls into computer integrated manufacturing, because an operator is no longer relied upon to go and set the depth of a cutter or to set how long or where the fold is going to be, or any of these other operations. So we are really looking at the infancy in a very new thing but it's moving along very quickly. There are some very significant benefits of digital ink management, and I'm only talking

right now about digital ink management, because this has been employed in many shops, and these are documented benefits. They are not a marketing person saying well this is what it's going to do for you. This is real life from benefits of what happens. We are seeing basically reduced make-readies anywhere from 10% to 30% based on the age of the press and some of the automated features. You know I can't come and stand up here and say it's going to cut 15 or 20 minutes off of your make-ready time because it varies based on the press; how old it is and what kind of automated features. But typically we see about a 10% to 30% reduction in make-ready time and with that you have less ink waste and less paper waste. It also allows accurate and repeatable ink settings to be generated, and it will illuminate or minimize the manual step of going in and setting ink keys, whether it's from a console or whether it's actually going if you have a very old press and setting keys. And really digital ink management is an extension of the plate scanners that I think we are all familiar with, only you are illuminating the optical effects, dust and dirt in the system, It's a much better way to generate that data and set the ink keys on a press. And you are going to increase your press productivity by incorporating digital ink management basically because you are reducing your make-ready time. Again this shop in Arizona went from 8 press runs per 8-hour shift to 10 press runs per 8-hour shift per press; they had two presses there when I was visiting them. So a significant improvement that basically paid for itself from and ROI prospective in a couple of weeks really. Now I'm most familiar with our product, so I'm just going to give a quick overview of how we do things just to illustrate how user friendly this can be and how automated the process can be. Basically our product measures the amount of ink coverage per zone. You can automate the pre-setting of ink keys. It can feed information directly to the press, but something else we do, which not a lot of presses out there today will accept, this digital data. We can actually generate hard copy output to hand over to a pressman so he has a better tool to set those ink keys initially, or we can put that digital data along the bottom of a blue line proof, so that you can hand that off to a press man and he lays it down on the console and can physically see the ink key settings on that sheet in front of him. He really automates the process and makes it much more repeatable and reliable.

Basically the way it's implemented in our implementation is quite simple, inside of our digital front end brisk, we have a bunch of things we call atoms which are the operations that can be carried out with full automation. You just put the ink pro atom into the template into the hot folder. When that data gets to that hot folder, we generate a low-resolution copy of that imposition, send it over to a Macintosh computer which you see on the screen there. The Macintosh generates either the PPF, the print production format, or whatever the native format depending on whose press it is or will even generate hard copy output based on what press you tell it you have, how many ink zones, what's the width of each ink zone, so we create this digital file, and we can either send it over to the press or again print it out on hard copy. I just want to show you real quickly

that basically the top line of things here is the atoms, and the second one from my right, your left is ink probe. By clicking on that, it goes down into the template, which allows full automation. It's that simple from the digital front end perspective to generate that file. You can also take that file and with automation send it to the Macintosh station. On the Macintosh station someone just calls up the file, says what's the front, what's the back, defines the press, defines the size of the press, and how many ink zones. This is also very customizable based on whatever presses you have. We will generate that ink data either hard copy or digital file. The last thing I want to point out is that today we are supporting all of these presses, press manufacturers as well as a number of others.
Any questions real quick?

Q: Does the Arizona customer, or any other customer, use CIP3 in the context of a larger enterprise management system?
A: Today that customer is only applying this data into his press operations, but he is looking for bindery equipment that will support CIM Computer Integrated Manufacturer. So, today, no, but his vision for a year, two years out is to plan on incorporating as much automation and integrated manufacturing as he possibly can. Keep in mind that what Scitex is doing is not unique. There are a bunch of different manufacturers who are looking along this line as well. Creo, and others as well. So this is kind of the shape of things that are happening. I think Heidelberger is one of the leading operations exactly.

Bill Ray: Thank you, Leigh.

We now move on to Udi Arieli from AHP Systems. Udi works in operations research, and we share a client in common – Valassis Communications – where we have integrated our respective products.

Udi Arieli:
My name is Udi Arieli. I am from AHP Systems. We are in Des Plaines near Chicago, Illinois. I want to come and talk about something totally different, but all connected. I think you have heard quite a bit today and yesterday, and I am sure in many other conferences or articles that you have read about the technical side of work flow management. Bill was talking yesterday about how do you store the data and centric databases and automatic management of centric databases. I want to talk about something that is above all of these things. We are speaking about how to save time and money by moving data through CIP3 but there is still a much bigger picture that we have to talk about. So let me tell you a little bit, about twenty minutes. First of all, the name of the company is AHP Systems. As you can hear from my accent, I came from Israel. I came to the United States in 1984, and since I came I've started to lecture and talk about the theory of global optimization. This is really the key to all that we are talking about above the technical solutions as I call them. I have to explain a little bit about the theory and why it is so important. I call it "Global Optimization,

Shattering the Myth". The name of our product is Kieren, or Kieren 2000. I don't think it's a secret that printing companies are looking to become more profitable, more competitive. I don't think that there is a printing company, or pre-press company, and I know that a lot of you are more connected to pre-press and presses, but still wherever you are in the pre-press or press environment, and bindery environment.

There are a lot of issues of profitability and competitive edge nowadays between companies. Everyone is trying to find solutions. Why? There are many reasons. I just try to summarize some of the main ones. Shorter runs, shorter make-ready time and because of this, low profits. Anyone that doesn't agree that that's what I call the trends of the industry nowadays? I've visited many printing companies, both in United States and Europe, and all of them have the same problem. Everyone is going to versioning, everyone is going to lower quantities, and if you heard some of the lectures yesterday, they were talking about lower quantities and where is the breakup point between different manufacturing methods according to quantities. How does the industry deal with this problem of low profits, hard competition, smaller runs, lower cycle time to manufacture the job? Everyone comes to the printing industry and he wants the job today and he really wanted the job yesterday. I remember when I owned a printing company in Israel called Israel Press and I remember when I use to work with my father in our printing company, the customer came (and I'm talking 15 years ago) and my father would ask when he wanted the job for and he said yesterday. So that was already 15 years ago, think about today when everyone is used to computers and so on. So what do people do, They are buying your equipment, which can do the trick. Of course, go to digital processes, not just only in the pre-press, but also in the press. In other areas, they are all going digital. Does that really solve the problem? Does is solve all of the problem? As I said before, I think you will agree with me that the printing industry is going digital ~ everything is digital, pre-press, press and a lot more of course, right now and in the future. So why don't we have more profits? We just heard a second ago, I'm not attacking Scitex or anything ~ actually I worked with Scitex for many years, but all that equipment manufacture, all, promise when you buy their equipment that you will see all of these savings and tomorrow morning you are going to make a lot of money. All of the technical solutions including CIP3 are in the right direction, but still we don't see the bigger profits in a lot of companies.

A lot of companies that invite me to give them consulting or show them methods and products, complain about the same thing. Yes, we went digital, yes we bought automatic blanket washers and we cut down the make-ready by a lot, but why don't we see the profits? There is a simple explanation. We gain capacity on one hand by sending instructions through CIP3, but guess what -- you are losing it somewhere in the organization. So by winning in one place, you are losing it somewhere else. Maybe you will gain capacity in the press and you save some make-ready time, but you lost it in the bindery. Secondly, who even

said that the press time that you save was the bottleneck, or what I call the constrained core center, because the core center didn't matter if you save some time, or it doesn't matter as much. Anyhow, so a global view of the company, global optimization, and global synchronization is the key to the answer, not the whole answer, it's the key to answer. It's all like a big puzzle-- there isn't one silver bullet that will solve all of our problems, but a combination of all of them will solve the problems. We have already seen some success stories. I'll talk about it in a few minutes. The technical solution must be accompanied by change in philosophy, a change in the paradigm. That's maybe the most important thing with new tools.

There is an old paradigm; I can't go into it a short lecture, in the printing industry. It hasn't changed for who knows how many years. Possibly since my grandfather started our printing company in Israel in 1921. This paradigm shift changes the way you manage the business and the technical tools that you are using. We need to shatter the myth that dominated the industry. I have spoken about it since 1984, and I'm happy to say that between 1984 – 1986 or 1987 we didn't have one customer, but now we have many, and many more are listening that something has to be done.

Together with people like those on this panel it can be done. I can not do it by myself. I can only give part of the solution. We need integrated standard between all equipment and processors, like CIP3 even though CIP3 have been to many lectures, and I give lectures on CIP3. CIP3 was not designed for it really, it was really designed only to move ink setting for pre-press to press and a little bit of bindery, but we need a lot more. So I don't want you to think like a lot of people will promise you that CIP3 is going to solve your problem, it's not. Not at least in the way CIP3 is at the moment.

We need the Theory Global Optimization and we need the new paradigm. The wider perspective of the plant should prevail over the narrow focus of a single job or core center. The printing industry is always operating on a job by job basis -- that is what job cost or cost accounting is all about. We have to go and move into a wider perspective and check what the whole company is doing and not job by job. So, what we manufacturer is far more important than the job costing or cost accounting. The profitability of a company is gated by the sum of all the jobs not job cost. So, you are going to have a profitable company if the collectivity, or the collection of all your jobs together is profitable, and not job one or job two.

Actually, a few jobs can look very bad when you look at the job cost; you will still make more money manufacturing them. Here is another surprise, everyone thinks or at least a lot of people think, that digital processors because they are fast, they are on a computer, they need less management and need less control. They think that they will just buy pre press equipment or digital presses and off I

go-- not true. Actually digital processors need more optimization and synchronization than traditional processors. We need a total solution including optimization by an integrated and highly automated approach to the management of data objects.

That's exactly what Bill is doing. I just want to tell you for a second about Valassis. I don't know if all of you are familiar with Valassis Communications. It's about a $600,000,000 insert printer, but it's much more than insert. They print over 3000 different types of jobs. At Valassis, AHP took upon itself to totally automate -- from the sales rep accepting the jobs, keying in some specs about the job, and everything else is automatic. First of all they are using Kieren 2000 optimization tool to automate the whole process. The process is totally automated where there used to be sixty, seventy, eighty people doing estimating, planning jobs, there are now just two or three of them.

AHP is using Kieren intelligent tools to create and schedule all jobs automatically. That is something that I was told for many, many years is impossible to do. First of all, everyone said how will you schedule a printing company? We are the first company that managed to really schedule, not load, really schedule and optimize a printing company. Secondly, how will you create the job automatically? Every job is different-- not true by they way. We changed the paradigm using AHP and Group InfoTech, because what we did at Valassis, we connected. I'm sitting at the top optimizing, synchronizing, creating the jobs, scheduling the jobs, and then I can move data off job ticket data and scheduling data to Bill's group, and they would know where in the database all the elements of the job are. It's not totally finished, but almost. We did integrated automated management of data.

Here are just few of the screens. Here on the screens: this is just an example of a Gantt chart as you can see. Here on the left, you have all the different core centers. Here you have the different jobs. When they are green, it means that they are predicted to be on time from the beginning of the process until the end. When they are in red, they are predicted to be late. I don't maintain my database, so of course, that's why a lot of them are red. What you see here are the links, because when you have processors you are allowed to have unlimited number of items or components that you have to schedule and synchronize at the same time. Some of them can be done in par a little, and some of them have to be done in serial. There are a lot of constraints in the meantime. Maybe, you are expecting the paper sometime in the future, maybe post sometime in the future, and so on. So, here is just an example, and this is totally interactive and changes online all the time. Another concept, I call it global objective indicator. How does the company know if globally that they are doing better now than a minute ago, or ten minutes ago, because things are changing on the floor all the time. Both income, job that should have taken an hour takes two hours; scheduling changes, schedule a new job that came in. How do they know as a global, if a

company is doing better or worse? That is according to the global objective indicator that I give you a number. The lower the number, the better it is. Of course, I don't have time to explain all of it but you can see that this schedule, which is 31.6, is better than this one which is 31.9.

I'm going here to a database; this is a real database. We did the same thing at Quad Graphics and Banta Digital and many other companies. Look at the one-color press over here. This area here is an additional make-readies that we have to do, because the job before is different than the job after. That's really the issue. With ink setting, for instance, you can cut the time by moving the ink setting. If the job before is very different than the job after, that's what most of the make-ready comes to. We are optimizing by grouping similar jobs together and cutting the make-ready. I'm going to group similar jobs together according to press sheet size, or it can be also web width, or anything you want. You can see how quickly it did optimization for me. I got a new number, 27.2, which is lower, so I know it's a better schedule. What happened to the hours? You see, before the set up hours was 123. What happened to the hours now? 104, we just saved 19 hours. Let me do this again. I will go and add another rule. I'll do it by color. So I am doing it by size and then by color. Here I will optimize again. It changes, you can even see graphically that it changes, but we don't know if it's good or bad for the company. Yes, we went down to 95 hours. So we started with 123, and now we are now 95. Let's see if any jobs became late because of this trick. No jobs. What I have just proven to you is that by optimization, I have saved by grouping similar jobs together, but at the same time, not making them late. I've just saved 29, 28 hours. Can you imagine? Now you can go and sell this 28 hours for just above your variable cost -- which is close to nothing -- and you will make more money in the company.

Intelligence, that is one of the takeaways that you should get from this. This is a real system that applies as an AI tool to schedule.

Bill Ray: Now, we are going to go another 10,000 feet up and take a look at the Object Management Group. Keep in mind, this is a form of standards organization. They are an industry consortium. This is how we stick the big blocks together from a larger perspective.

Andrew Watson:
Okay. Yes, a very high level background really today. Twenty minutes on the problems that the software industry faces today. I'm sure you will recognize some of these problems in the software that you use every day, and what our group, The Object Management Group, is doing about it. Hopefully, by the end of this talk, you wont have burning insights into how to solve your scheduling problems, but you will have at least some background information on what the software industry is doing with integration problems between separate software packages.

I should introduce myself. My name is Andrew Watson. I'm the VP and Technical Director of Object Management Group. So, I will now give you some background on a couple of problems that faces the software industry today. Up until today, writing software has been by analogy a little bit like filling molds with concrete. You come up with a set of requirements. Your customers have a set of requirements. You run specification from that which defines what software is going to do. Then you or your programmers write codes that will fulfill those requirements. At the end of that process you have this big, rigid, monolithic, thing that does one job or a fixed set of jobs. Now, Huntly does them well but isn't what you might call adaptable. There really are no identifiable parts that can be reused for other applications. It's hard to change the shape of this application. If you do try, it breaks. Software maintenance is a notorious black hole for effort in the software industry. The older the piece of software gets, the more you try to bend it and adapt it and adapt it to fulfill some new task, the more effort you have to try and sink into that to do it. The fabric of the software gets stressed. Eventually it becomes impossible, and you have to throw it away and start over. Another consequence of that is that as we try to adapt what software does to the changing needs of the organization it serves, we can't adapt smoothly. Organizational requirements change incrementally, smoothly at the time. The software, unfortunately, basically needs to be torn apart and put together into a different shape in a series of catastrophic discontinuities. Everything changes all at once to achieve some new stable plateau, and then it all needs to change again.

One of the things that we are aiming to do at Object Management Group, and indeed it's a current theme in the software industry as a whole, is to change the way we build software into something that uses more modular parts. The catch phrase that people use for these at the moment is "components". By the way, a great way to start an argument amongst your software savvy friends is to get three or four of them together and ask them what a component is and stand back and watch the fun. Any three people will raise at least five or six different opinions of the moment. This is very much leading much visionary technology in the software industry today. I think most people will agree on the number of characteristics of components; that they will help us to overcome these problems that I have just described by basically turning software engineering into an engineering discipline. As with so many other disciplines that have engineering or science in their title, software engineering basically isn't an engineering discipline. It's a cottage industry today. We build single handcrafted beautifully sculpted pieces of software for one particular job. What we don't do is to use re-usable parts as the engineering does, to build a number of different products for a number of different solutions. One of the efforts that OMG is coordinating today is an effort to build a component architecture to allow us to achieve, essentially snap together, logos style productivity for software products so that once we have a piece of software that solves one particular problem. If the problem changes, we can re-configure it, snap together new parts, pull out parts

that we don't need, quickly and easily. Then we turn to a slightly different problem that we are also starting to have to address in the software industry today.

Basically, the applications that we use in businesses today (This example is drawn from the engineering business, but maybe you'll recognize aspects in your business.) are very much islands of automation. We intended to automate, in this example, inventory separately from manufacturing, separately from design, separately from accounting. Where the information that those different parts of businesses overlaps, we often find people with multiple terminals on their desk copying information out of one system into another. This isn't what I signed up for when I became a computer scientist. The machine should serve the people rather than the other way around. In so many organizations, you will find people copying information by hand out of one system into another. If you are doing your scheduling, your jobs using your scheduling system, how does accounting know when a particular job is completed to actually bill the people concerned? I'll bet in all too many businesses, we just find people copying information out of one system into another. I think it is increasingly essential to make these separate applications work together, not least because we are starting now to build systems that span individual organizations again. We need to make the systems talk together. The bad news is if we are doing that with our trading partners, nobody is in overall charge. At least if it's inside one company, at some point somebody will come along and say we are going to use this standard or we are going to use this piece of software. If you are dealing with your supplier, they are using an incompatible system with yours, unless you are a very large customer, and of course it does happen. You basically can't go to your supplier and say 'you are going to use this for my convenience'. We almost wouldn't want to do that, because to impose that kind of straight-jacket of uniformity would stifle creativity, which is an essential business driver and an essential economic driver in our businesses today.

If we take the problems that I've given you on the last couple of slides, then I think we can agree that there won't be consensus on so many issues, like hardware platforms where we have two different sets of hardware platforms on the podium today. I'm happy to see that, at least in this setting, I'm not outnumbered as a Macintosh user. Usually I turn up with my Macintosh to do these projections, and they look at me as if I have two heads, so I feel right at home here. There will not be consensus on platforms, operating systems, network protocols. What we have to build is consensus on interfaces between applications, between programming systems. That's what OMG is in business to do.

OMG, the acronym stands for Object Management Group, was set up in the late 1980's to use the technology that was emerging from the research labs at that time – Object Technology – to help address these problems. Objects in the

software business today is roughly synonymous with good. We have objects in the name of our group, but we are not really fixated particularly on object technology, as an end in itself, but as a means to an end. The end is solving the problems I've described earlier. We are a non-profit industrial consortium. We have roughly 800 members drawn from both software and hardware suppliers and organizations that use computers but don't actually sell them. We serve as a forum where vendors, mainly of software, can agree on compatible interfaces to competing products. Essentially, we are a standards organization, but we don't call ourselves that. We don't want to tread on the toes of, for instance, ISO and ANSI and other standards organizations. We are effectively a defacto standards organization. We have an open process for agreeing to the standards that we set, with the decisions in that process taken by our 800 member organization. The interfaces, the documentation that we produce, is freely available to everybody, in particular through our website: www.omg.

Incidentally, I will be able to make slides available later. I don't know what method we are going to use to distribute them, but they are in PDF; another reason why I feel right at home here. Again, usually I'm the rank outsider when I turn up with a PDF presentation.

Our architecture is based on an open architecture, called the Object Management Architecture, which is independent and neutral of particular programming languages and platforms and is based on object and called CORBA. Many people in the software business have heard of CORBA. It's a very widespread standard for achieving links between separate applications. So let me give you a quick one-slide tutorial on why Object Technology, the thing that we base our approach on, why it helps, why it works. As somebody who travels way too much, I'm going to draw my example from something that perhaps you are also familiar with: hiring a rental car. If you go and hire a rental car, you stroll into the pound at the airport, you get the keys, you get in, you go. I can't remember the last time I found a user's manual in a rental car. I can't remember the last time I looked. That's because, essentially the interfaces to all motor cars are roughly speaking the same. Modular minor differences on whether you drive on the correct or the wrong side of the road – on the left. Incidentally, do you know why the Brits and the Japanese and the Swedes, about 30% of the world's population, drive on the left? It's from the old days. If you were a knight -- an armed man -- and right handed -- as was most of the population -- as you were going along a wide road, you wanted to make sure that you had your sword hand towards whoever was coming towards you. So if they turned out be unfriendly, you could deal with the problem. So you walked on the left-hand side of the road, with your right hand available. Every time I drive through a drive-through ATM machine, I reflect on the fact that basically Americans got it wrong because you need to have your right hand out of the window of the car to operate the ATM. So, now you've got basically everybody driving on the left. How does it happen then that half of the world switches to driving on the other

side of the road? Well, the French revolution comes along. In revolutionary era France you've got all the gentry, the knights and so on. They are all riding and driving on the left. The peasantry walk on the right, so they can see the gentry coming, so they don't get run down – just as you do today when you are walking on a main road. It's revolutionary era France, so here's your choice: Do you walk on the left and be identified with the gentry, they are the ones queuing up for the guillotine or do you walk on the right with the peasantry (they are the ones operating the guillotine)? Seems like a pretty clear-cut decision, I would imagine. So France and large parts of continental Europe switched to driving on the right and various other renegades joined them.

Let's get back to cars. Modular, the steering wheel being on one or the other side of the car. Essentially the interface is the same. The pedals are in the same places, the gear sticks and the same slots in the box. You switch between gears in the same way. I was actually quite struck by how essential it is that the user interface remains the same. When I went to Australia a couple of years back, I thought no problem here. They drive on my side of the road. (The tip is, incidentally, if you switch back and forth a lot, just keep most of the car between you and the curb. That always works for me.) So I remember Australia. I get to the first intersection. I go to single a turn. I switch on the windscreen wipers. Turns out about half of Australia, rather than following international standard of having the turn indicator on the left, have the turn indicator on the right stalk of the steering wheel. So some deep reflex in my brain programmed over decades of driving knows that if you are going to indicate a turn, you reach up with your left hand, and operating the turn stalk is wrong. In the two weeks driving around Australia, every time I get to an intersection; I would switch on the wind screen wipers. It really brought home to me how essential it is that the interface remain the same. Meanwhile, all of those cars that I've driven all of those years, in all of those different countries, are wildly inside. Different engineering technologies, transmission technologies, number of cylinders, all sorts of different implementations. I don't have to care about that; all I have to care about is that the interface remains the same. This is the underlying principle behind Object Technology and Component Technology in the software business. The idea that you can vary inside, the implementation of a part, provided that the interface remains the same, you can freely substitute it for the one you were using last year, which was perhaps slower and had lower functionality or whatever it is. Also, it's what allows you to divide and conquer and divide the problem of building of the software system up into different interlocking parts that can then be snapped together.

This is the technology with which the Object Management Group is working. OMG has worldwide membership. I can't get all of the members on a slide in a point size that you can read. So I have just picked a few hear. My apologies to anybody who knows that they are an OMG member but their name isn't on this slide. What I'm attempting to do is just to show that they are drawn from across

all sorts of industrial segments. I don't specifically know of any printing or graphic arts companies that are members. Adobe is a member; there are a couple of others. There are certainly plenty of users, technology users, banks like JP Morgan, NSA whatever it is that they do, people like Reco, SAP; lots of different companies; many of them large users of software technology. Membership is about 70% North American, about 30% European with a good, healthy cross-section of the Japanese industry represented by people like Itachi and so on as well. In a single slide, I'm not going dwell on this, but this is one slide diagram of architecture based around the idea of a common software interface. This is CORBA. It allows you to exchange information between objects, parts of your applications that perhaps distributes across different computers, perhaps even on different continents, cooperating with each other. CORBA is about a ten-year-old standard at this point. I'm happy to say that it gets plenty of plaudits and praise from various users. Here's a couple of quotes from a report; it's a multi-page report but drawn from the executive summary, the conclusion of this group. The US Defense Information Systems Agent says it is for their middle ware, they're saying use CORBA. These people basically serve as the IS shop for the whole of the US Military. The US Military has plenty of exotic problems that are specific to the Military, but also plenty of fairly boring, straight forward IT applications that everyone will recognize like payroll, and inventory management. They tend to call inventory management things like logistics. Logistics was once defined to me by a logistics officer in the US Army as 'logistics is about getting it from here to there for all possible values of it here and there'; I think he summed it up nicely.

There are plenty of implementations of the technologies that OMG specifies. I must stress again, OMG produces specifications. It is vendor companies, both OMG members and non-members that actually produce implementations to these standards. There are plenty of implementations from all sorts of companies. It is possible in fact that you may even be using some CORBA based technology today and not know it. It is starting to appear in things like Netscape navigator, every copy of Navigator 4 has CORBA built into it. There are some applications that use that to communicate between Navigator and central servers. Lotus Notes 5, again the new release of Lotus Notes, has CORBA built into it. New releases of Novell NetWare has CORBA built into it. It's starting to pop up in all sorts of places.

I'll just touch on one other thing that OMG does; just a single slide here. We also now own the Unified Modeling Language (UML), which is an annotation for software design. I'm really not going to say more about that other than to point out that until a couple of years back, there were dozens of different or at least half a dozen different software design methodologies and notations, and because of the level of diversity, there was a lot of confusion about which one to adopt, which one was 'better'.

Well, nothing breeds agreement and uniformity like taking away choice. I'm being a little bit facetious there, but essentially the players in the business recognized that this confusion was preventing people from adopting software design techniques. There are a lot of people just standing on the sidelines and saying 'we don't know which one to choose, so we won't choose one at all'. Under the aegis of OMG, a number of organizations including IBM and Rational, one of the big players in the area, came together to agree upon a common Unified Modeling Language under OMG.

So if you are talking to software designers, and you mention your method to them, they will recognize that you are talking about this Unified Modeling Language, a common software design notation. What they may not know, is that it is now an OMG specification, an OMG Standard.

Until a couple of years ago, OMG focused on the low level interoperability that I've been speaking of; how to get different software packages to work together in the general. In the last couple of years, we've been focusing more and more, on setting standards for interruptability in particular application domains in particular industry segments. We are currently looking at working with GCA, Jim Harvey and his people, on how we can extend this into the printing graphics arts industries.

I can give you a couple of examples from industries we are already working in. For instance in healthcare, healthcare records maintenance is a big issue. It is not of course going to concern anybody much in other industrial segments, but if you are in the healthcare business, making sure, if you have two different records that appear to be for the same person, that they really are for the same person and linking them together is a major concern. In 95% of the time it is pretty easy; you just match the names and dates of birth and so on. In 5% of the time it is actually pretty hard, especially in a country like the US, where you have to pay for health care.

A certain fraction of your customers are actually actively out to fool you. They want you to believe that they are somebody who they are not, because that other somebody has healthcare coverage. There is an example of a problem that a medical practitioner gave to me the other day where they had an audit on their healthcare records. They had this woman who had parental care. They discovered that she actually had three babies in one year, not triplets, three separate babies in one year. They dug a little deeper and discovered that the one women had health insurance to cover prenatal care. She had her baby and gave it to her sister. After her sister had her baby, she gave the card to a friend. As far as they were concerned, it was just a card that conferred on the bearer the right to healthcare. Unfortunately, inside the healthcare record system there were all sorts of data about allergies and blood groups being dragged around with her. So it's quite a miracle that there wasn't some sort of medical catastrophe.

I bring that up to show how something that looks like a relatively simple problem from outside an industrial segment can actually have lots of depth and substance inside it. So when we deal in these areas, we are very careful to recruit the professionals from the area who understand the problems to work on building interoperability, interfaces, and common specifications for interoperability between applications in those areas. As I say, we are looking at starting work in printing and graphic arts areas in that way. We have pretty good relationship with ISO. Essentially, you can expect to see OMG specifications become ISO standards over the next couple of years through a thing called the Publicly Available Specifications Process.

I will finish off with a very quick case study. This is the nearest I could find to a publishing case study from my portfolio. We have something like a couple of hundred success stories of deployment of OMG technology in the industry. This case study is CNN Interactive. If you visited CNN Interactive for your news or sports or weather in the last two and half, three years, you've been using a system that is based on the kind of technology that I've been talking about. CNN Interactive is a family of websites mainly based in Atlanta but with outposts in Washington, DC, Sweden, Latin America. It's staggeringly busy. 150,000 hits per minute on the CNNI Website. 77,000,000 page views per week. They reckon, when I wrote these slides in the last year, they had an estimated 11.5 million unique users per month, but it's going up something like 9% per month. In addition to providing that website, CNN also serves effectively as a wire service for high tech news providers, companies like Point Cast and Page Net. Page Net for instance provides news to people's pocket pagers. They get their news from CNN, repackage it for their particular distribution medium, and then send it out to their users. So CNN also has 65,000 users in 500 other news organizations like these; a lot of e-mail subscribers. They have an integration problem. They have this kind of problem that I was describing earlier of how to interface with their customers; they supply news over the wire. Initially they found themselves with multiple media formats, and they had to have a fairly large programming staff, who were just dealing with interfacing the different software technologies that they had from their customers, so they could actually get the news across to their customers. Also, they were having to move the stories around on their website internally, and that in itself is a fairly big job just because of the volume of news. So, they needed to separate the view from the content, what the story contained from the way it was presented, to all of these different customers and internally. They had to work across different platforms and languages. They came up with a notion of a content server that essentially stored stories in the mark up language. They didn't use XML; this was pre-XML. Essentially they used an XML-style mock up language and built a set of applications to distribute these stories mocked up to all the different customer websites and their internal customers. They've also put into place a series of vent notification services to allow notification of major news events to go to their customers like Page Net and Point Cast and so on. They have a polling

server. If you go to the CNN Website, you can click on a link to give your view on some particular current news story. Again that's very busy and they've built that polling server using this kind of technology. The conclusions that they've come up with is testimonial for the fact that the middleware that they've used based on OMG Technology, based on CORBA, has been a very robust solution to their problems and basically are going to continue to use it.

I have hundreds of examples of industries where this kind of technology has been of help. Again, a totally different type of application area: The AWACS Radar, early warning airplanes. I don't know if you know about these. These are basically airliners, Boeing 707's or 767's, with a huge radar antenna on top and a lot of powerful computers and radar equipment inside to help track air traffic in military, in war basically. On the basis of the high, you can get the radar dish, the further it can see. So if you fly at the rate of an airliner at 30,000 feet, you can see for hundreds of miles. The computers inside these AWACS machines date from the 1960's. They made a couple attempts to update them to 1990's technology, in particular because they had a Y2K problem. Reassuring, isn't it, to know that even the military has the mundane problems the rest of us do?

They finally achieved that using CORBA and it was quite interesting. They again, in pursuit of this idea separating interface from implementation, they actually took the original 1960's vintage consoles, screens and keyboards in the aircraft, ripped out all of the guts, replaced them with 1990's electronics but kept the displays, appearance the same, even as I say kept exactly the same keyboards and exactly the same consoles so as to upset and inconvenience the operators as little as possible. As of today, I think a wing of AWACS planes are flying based on CORBA technology, and in a couple of years time, they all will.

So that was a very quick cantor through what OMG is doing and how we build agreements within particular industrial segments for interoperable technology. We are hoping to work with GCA on doing this in the graphic arts arenas.

Thank you.

Bill Ray: A note to Andrew's presentation: In the ISO meetings prior to the conference, we had a speaker from Boeing who represented the Object Management Group, and they were considering the AMPAC data dictionary.
Talk to Larry Warter. He can give you pointers as to where to find it. It's a website. We are looking at AMPAC as a potential data dictionary for the movement towards, if you will, "CORBAizing" our industry.