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PowerOpen Association Announced

Many corporate computer buyers want the flexibility and freedom that come with “open systems”—that is, a computer architecture, implemented by multiple vendors, that can run a common body of software. In October 1991, Apple and IBM jointly announced an open-system environment, called PowerOpen, that would run on future Apple Macintosh and IBM computers. (PowerOpen is based on Apple’s A/UX 3.0 and IBM’s AIX, both of which are implementations of the UNIX® operating system. PowerOpen will be an alternative operating system for Macintosh PowerPC computers, but they will still ship with System 7 as their standard operating system.)

On March 6, 1993, a consortium of hardware vendors—Apple, Bull, Harris, IBM, Motorola, Tadpole Technology, and THOMSON-CSF—announced the PowerOpen Association, which has been created to promote the PowerOpen architecture as an industry standard. The participating vendors expect the PowerOpen Environment (POE) to become an industry standard that will allow customers to buy computers from a range of vendors and still have access to a large number of powerful applications.

One specific part of the PowerOpen Association story is of particular interest to the Macintosh community—namely, that Apple will be licensing some (but not all) of its Macintosh technology to selected vendors. This will allow other vendors to create PowerOpen-compliant computers that can run today’s Macintosh applications. Sometime in 1994, you will see other companies selling PowerOpen-compliant computers that can run most 680x0-code Macintosh applications.

DEVELOPER INVOLVEMENT

In general, developers will benefit from the PowerOpen platform because it gives them a larger audience for their applications. Macintosh developers will benefit doubly—once from the large installed base of PowerOpen computers, and a second time from the fact that both existing and future 680x0 and PowerPC Macintosh applications will also run, “as is,” on PowerOpen-compliant computers.

As a developer, you need to do only one thing to prepare for the PowerOpen platform: develop robust, powerful System 7 applications. If you “play by the rules,” your application will probably run on a PowerOpen computer without modification. (When you can, you will also want to add features to your application and recompile it to produce a “native” Macintosh PowerPC application.)

THE POWEROPEN ASSOCIATION

At the March 6 announcement, participants from the following companies announced their membership in the PowerOpen Association: Apple, Bull, Harris, IBM, Motorola, Tadpole Technology, and THOMSON-CSF. They also announced the creation of the PowerOpen Association, Inc. as an independent corporation with headquarters in the Boston area. Domenic J. LaCava, an executive with over 30 years of experience in the industry, is the president of the association.

This association, which expects to add new members in the following months, was formed to define and promote an open, multivendor standard for personal (and larger) computers. With this standard, software developers will be able to write software that will run on any PowerOpen-compliant computer from any vendor. The PowerOpen Association will also provide various services to developers who want to write PowerOpen software.

THE POWEROPEN ENVIRONMENT

This environment includes both hardware and software. A PowerOpen-compliant computer must run the PowerOpen operating system and use a PowerPC processor. The operating system is based on IBM’s AIX, which is a well-regarded implementation of the UNIX operating system, and Apple’s A/UX.

The PowerOpen Environment is just that—a development platform, not a specific product. Apple and IBM will both use PowerOpen technology to create their own versions of the PowerOpen Environment. Apple believes that users will buy its version because of the exclusive key technologies that Apple provides—

technologies such as AppleScript, the Apple Open Collaboration Environment (AOCE), and QuickTime.

The PowerOpen ABI (application binary environment) Specification is a set of documents that define the behavior of a PowerOpen-compliant computer. This includes both the application programming interface (API), processor-specific information, and interface specifications for networking and other extensions.

To make the PowerOpen Environment attractive to as many users as possible, PowerOpen users can use either of two user interfaces (or both, if desired)—the Macintosh interface and the popular Motif interface (as defined by the Open Software Foundation).

Apple will deliver the PowerOpen Environment in 1994 and will continue to sell its own integration of UNIX with the Macintosh environment, A/UX, for its 680x0-processor Macintosh computers. Apple will ship System 7 as the operating system that users get when they buy a PowerPC Macintosh computer. Apple's PowerOpen product will be available for those who want the advantages of both the Macintosh and an open system. This is similar to A/UX 3.0 today, which is available for 680x0-processor Macintosh computers but is not the computer's standard operating system.

MACINTOSH APPLICATION SERVICES

The Macintosh Application Services is an enhancement to the PowerOpen Environment that lets PowerOpen users take full advantage of the Macintosh environment—the Macintosh user interface, the System 7 operating system, the large body of System 7 software, and the Macintosh file-management system.

Of particular interest is the Macintosh Application Engine, which allows PowerOpen-compliant computers to run Macintosh System 7 applications. The Macintosh Application Engine includes a toolbox of routines like those in the Macintosh Toolbox, a Motorola 68040 emulator, and a multimode switcher that allows 680x0 and PowerPC software to run simultaneously. The 68040 emulator simulates a 68LC040 processor (the one without the built-in math coprocessor).

You can think of the Macintosh Application Engine as sitting on top of the PowerOpen operating system, using the operating system's capabilities to perform many tasks. In a sense, the Macintosh Application Engine simulates the high-level capabilities of a Macintosh LC III. This is similar to the code in Apple's

A/UX operating system that sits on top of the UNIX operating system and provides A/UX's Macintosh interface and services.

Apple has licensed the Macintosh Application Services to IBM and will consider doing
so with other PowerOpen Association members in the future. ◆

Macintosh Beats the Competition

Printing this news item is a lot like preaching to the converted, but it never hurts to have some numbers to convince management that the Macintosh platform is the one to develop for. The bottom line is that Macintosh computers often perform better than their IBM PC–compatible counterparts and that many Macintosh computers often deliver more computing power per dollar spent (see the graph on below).

The information in the graph comes from tests performed by Ingram Labs, an independent PC-testing company. Ingram Labs performed 57 tests on both IBM PC–compatible computers running Windows 3.1 and Macintosh computers, using nine leading applications that are available for both Macintosh and Windows. These tests were meant to approximate real-world usage.

“Macintosh vs. Windows Performance” shows the performance of ten Macintosh computers and ten DOS computers running Windows. Computers are ranked from the fastest to slowest on the horizontal axis. The individual data points are connected by a line; performance data was scaled to make the Macintosh LC II performance equal to 1.00. Each bar on the vertical axis indicates the computer’s performance per dollar relative to the other computers.

The big winner is the Macintosh Centris 610, which delivers 25 percent more computing power per dollar than a 20-MHz 80486SX PC running Windows. Be sure to compare computers by looking at the processor numbers and speed in megahertz—that’s the way most buyers will compare them. (For example, the above comparison is between a 68040 processor running at 20 MHz versus a 8048SX 6 processor running at 20 MHz.)

By looking at the graph, you can spot numerous cases where a Macintosh computer outranks a similar PC, either in performance only or performance per dollar. For example, the Macintosh Centris 650 (25-MHz 68040) computer has better performance for the price than 80486DX-based personal computers (specifically, a 25-MHz 80486SX and a 33-MHz 80486DX computer) and almost exactly the same performance for the price as a 50-MHz 80486DX2 computer.

Three other comparisons deserve mention. These are the cases in which Macintosh models are more powerful *and* provide more performance per dollar than its PC/Windows counterpart:

• The Macintosh LC III (25-MHz 68030) won over a 25-MHz 80386SX computer.

• The Macintosh Centris 610 (20-MHz 68040) won over a 25-MHz 80486SX computer.

• The Macintosh Quadra 800 (33-MHz 68040) won over a 33-MHz 80486DX computer.

Note that these three Macintosh computers are among the ones that Apple announced last February. ◆

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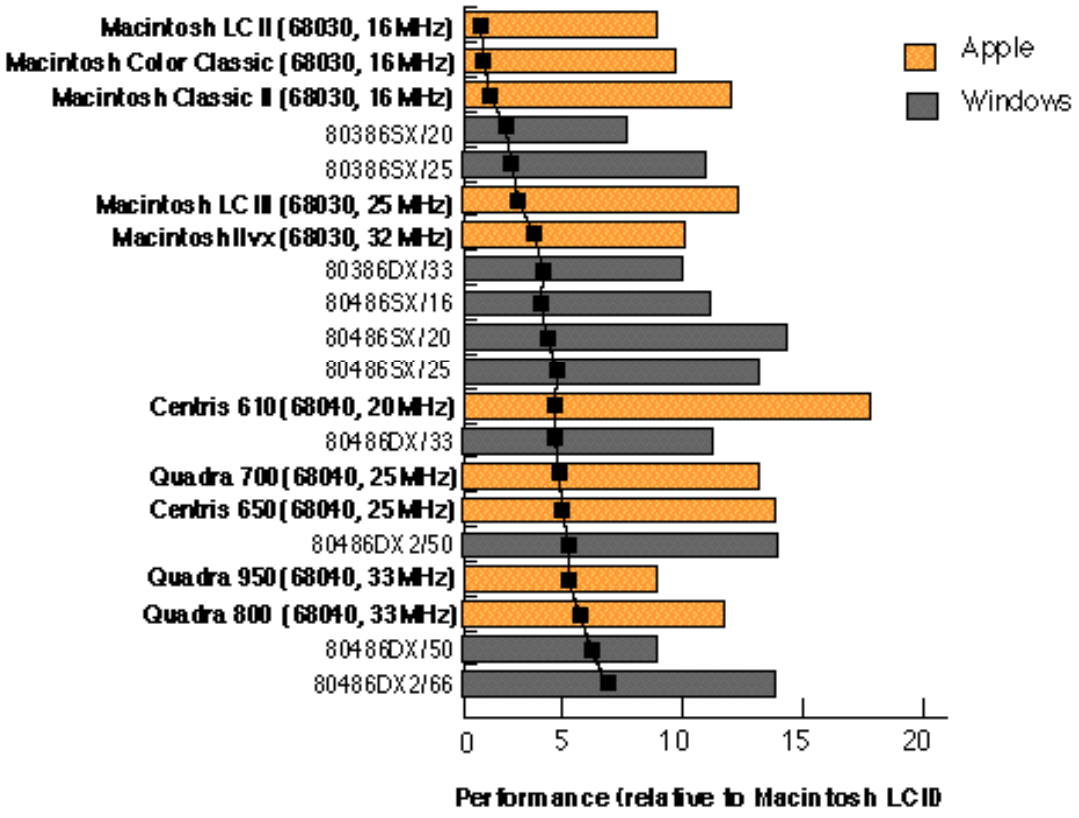

Macintosh vs. Windows performance. *This graph shows the relative performance of various Macintosh and IBM PC compatibles running Microsoft Windows 3.1. The data points (connected by a line) represent the relative performance of the computers. The bars represent the relative value of a computer by dividing its performance figure by its price; longer bars represent a greater value for the money. The colored bars indicate Macintosh computers. See the text for details on how the testing was done.*

Debugging Lab at Worldwide Developers Conference

Apple Computer's Developer Support Center (DSC) is hosting a debugging lab during the upcoming Worldwide Developers Conference, May 10 to 14 at the San Jose Convention Center, to assist all developers. Drop by the lab and schedule an appointment to discuss your development, product, or administrative questions. The lab hours are Monday 11–6, Tuesday through Thursday 10–6, and Friday 10–12:30.

Advance scheduling can be made via AppleLink using the Appointment Form (path—Developer Support:Developer Services:Apple Information Resources:Developer Events:1993 Apple WWDC) from April 5 to May 5, 1993. To schedule an appointment after May 5, drop by the DSC scheduling table on May 9 during conference registration, or visit the lab anytime throughout the conference.

Please return all appointment forms via AppleLink to DEVSUPPORT. You will receive a confirmation of your appointment via AppleLink, if you respond before May 5.

We're looking forward to seeing you at WWDC in May! ◆

It's Not a Macintosh!

Apple's First Hardware Servers

Apple Workgroup Server 95. Apple Workgroup Server 80. Apple Workgroup Server 60.

Just the names of Apple Computer's first line of hardware servers tell you that they symbolize a bold, new business direction for Apple.

That's right, they're not called Macintosh, even though each server is based on the hardware of an existing 68040 Macintosh computer. One of them, the Workgroup Server 95, even ships with a different, truly multitasking operating system—a new server version of A/UX 3.0.1, Apple's version of UNIX that lets users run both Macintosh and UNIX applications.

In unveiling the new computers at the Hannover, Germany, CeBIT Computer Fair March 25, Apple's Enterprise Systems Division (ESD) also announced two new versions of AppleShare, Apple's file and print service software, to go with the hardware offerings and an exciting new network service called AppleSearch (see article, page 5). All the products will be released at competitive prices by the middle of the year, starting with the Workgroup Server 95.

Together, the new products represent a big step forward in implementing Apple's business strategy, which for two years has been aimed at delivering products in three areas: mobile computing, the Macintosh desktop, and enterprise/business computing.

Networking products are now far more than an added value for Macintosh users, a way to merely boost stand-alone Macintosh computer sales. Apple's servers and services are a business by themselves, designed aggressively to lead the way into business and educational settings, large and small, and, eventually, into new markets.

Says Jim Groff, senior director of ESD's Servers and Services Group, which developed the new products: "We've had in the past software that has allowed Macintosh computers to become servers, but never before hardware systems that were specifically designed to be servers. Three years ago the climate at Apple was 'We don't do servers; that's somebody else's business.' That all changed at CeBIT." (For Apple's enterprise systems strategy and how these new products fit into it, see the story at the bottom of page 1.)

DEVELOPER IMPACT

Additionally, the new products offer many opportunities for developers. Traditionally, Apple's networking technologies have affected developers of in-house network systems more than traditional, commercial developers of shrink-wrapped, off-the-shelf software. These new servers and services, though, should provide the second group many opportunities and challenges they've never had before.

Groff elaborates: "There's a real rich set of add-on opportunities for these servers: networking cards and drivers, interface cards for peripherals, and backup devices.

"We've always seen developers who have enhanced and extended the capabilities provided by Apple, and there are opportunities for that here," he adds. "For example, AppleShare itself doesn't provide accounting for disk utilization or connect time. In an environment where a server costs $15,000 and its cost has to be charged back to departments using its services, that kind of accounting feature can be important. That's just one example of developer add-on opportunities with the servers." (Fully loaded with software and peripherals, a Workgroup Server 95 will retail for $13,000 or more. See the Workgoup Server 95, 80, and 60 fact sheets on this page, and pages 5 and 6, for product details.)

Apple Encourages "Server Awareness" in Apps. The new servers and especially the services will have specific implications for application developers. Again, Jim Groff: "In the same way we encouraged people to have applications take advantage of QuickTime, we'll

be asking developers to make their applications aware of the fact that, more and more, it will be likely that they're working over a network.

"That definitely has an impact on application design. If I were a developer, I'd want to make sure I'm using locking calls and all the other things that prevent User A using my app and User B using my app from going at the same document or the same data at the same time. With tens of thousands of servers out to the marketplace over the next year, that kind of situation will become increasingly likely.

"There are also opportunities created by the combination of the servers with AppleSearch and AOCE. Developers will want to look at collaboration, content organization, and information search and retrieval as elements they'll want to add to applications. And with AppleSearch, packaging and providing content and information becomes a major business opportunity."

SOME STRATEGIC CONSIDERATIONS

These new products are positioned for great success in the marketplace. In particular, the new servers perform as well as any other server currently available; they're far faster than previous versions of AppleShare running on even the fastest Macintosh.

The performance standard for local-area-network servers today is Novell's Netware running on today's fastest Intel 80486-driven personal computers. From a Macintosh desktop, a Workgroup Server 95 running AppleShare Pro, a special version of AppleShare, delivers performance that's competitive with Netware running on fast 80486 servers. The Workgroup Servers 60 and 80 also perform as well as the best servers in their price range.

A Fast Family. All the Workgroup Servers run faster than any previous Apple server. The performance benchmark Apple used for comparison is input/output (I/O) with AppleShare 3.0 running on a Quadra 950. The new AppleShare 4.0 on the Workgroup Server 60 is twice as fast as that and it's three times as fast on the Server 80. AppleShare Pro on the Workgroup Server 95 is over four times as fast. As Jim Groff says, "It's a great family story, from peer-to-peer file sharing built into System 7 through the high performance of AppleShare Pro."

Cheaper To Own. But there's more. Since all the Apple Workgroup Servers deliver the traditional Macintosh ease of use, the new servers can be set up and installed in minutes, just as easily as any Macintosh. Other vendors' servers can be far more complicated; as one well-placed Apple manager asked rhetorically, "Have you ever tried to administer one of those suckers?" By comparison, Apple's servers will save customers a lot of money they'd usually spend on server administration.

In selling the servers, Apple is trying to convince the market to look less at the purchase price, which is comparable to other products, and more at the annual cost of ownership, which includes paying people to maintain and administer the equipment.

A study recently completed by the Business Research Group (BRG), a Boston consulting firm, concluded that Macintosh ease-of-use translates directly into money saved in the server arena: BRG found that administering an AppleShare server averages $10,000 less per year than administering systems from the four other leading server vendors. Compared with one vendor, AppleShare is nearly 75 percent cheaper to administer for a year. The illustration on page 6 shows just how AppleShare cost of ownership for one year stacked up against the competition in the study.

Server Solutions. Another part of Apple strategy behind the servers is that each of them leverages off existing 68040-driven Macintosh hardware. The Workgroup Server 95 is based on the Macintosh Quadra 950, the Workgroup Server 80 on the Macintosh Quadra 800, and the Workgroup Server 60 on the Centris 610.

Servers and Services Director Groff again explains: "It's a solutions story, taking things that have already been developed, repackaging them with different software, and using them to

reach a different market and address its needs. The result: we get more out of our R&D dollar."

So the strategic story for the new servers can be summed up in a few words: competitive performance, dramatically lower cost of ownership, and a market-driven solution.

Apple Direct will come back to the developer implications/opportunities created by these products in future issues when the products are available. (Developers thirsting for in-depth technical information in this area will find it at this year's Worldwide Developers Conference; see the article on page 3.) The remainder of this article provides a brief description of each of the announced products, approximately in the order in which they'll ship.

WORKGROUP SERVER 95

First up will be the most powerful and expandable of the bunch, the Workgroup Server 95, due by May. The Workgroup Server 95 is designed to provide file, print, and database services for large or data-intensive workgroups. Apple has thus worked to make special database server software available near the time of its ship date.

The Workgroup Server 95 uses the Macintosh Quadra 950 hardware platform with some significant enhancements: a processor-direct slot (PDS) accelerator card that provides up to 512 KB of second-level cache memory, SCSI DMA (direct memory access) for accelerated I/O, and parity RAM for reliability and data integrity.

It's built around a Motorola 33-MHz 68040 processor and comes with 16 MB or 32 MB of RAM (expandable to 256 MB), a built-in Apple SuperDrive floppy disk drive, built-in Ethernet, and a choice of 230 MB, 500 MB, or 1000 MB hard disk drives.

Talk about expandable: The Workgroup Server 95 contains 10 built-in ports for peripherals, can house up to four internal storage devices and as many as 20 SCSI devices, and offers five NuBus™ expansion slots. Optionally, it can be ordered with an internal CD-ROM drive and a digital data storage–data compression (DDS-DC) 4mm tape-backup drive capable of storing between 4 and 6 gigabytes of data.

System Software. The Workgroup Server 95 ships with a new version of A/UX, which puts the System 7 interface on top of the industry-standard UNIX operating system. For its server version, A/UX has been optimized to support file, print, database, and other network services. It also features asynchronous I/O and SCSI DMA driver support and supports AppleTalk and TCP/IP networking protocols. Its System 7 interface makes it easy to install, use, and manage.

A/UX for the Workgroup Server 95 ships with server administration utilities, including the new version of Dantz's Retrospect Remote, which supports both Macintosh and UNIX file formats. Also included are online documentation and Apple DocViewer, which provides quick access to on-line information with its keyword search feature.

Server Software. Apple engineers have tuned AppleShare server software to run more efficiently with its 68040-based computers. The results of their work will be two new AppleShare products, AppleShare 4.0, available later this summer for the Workgroup Server 60 and Workgroup Server 80 models, and AppleShare Pro, available in May for the Workgroup Server 95. Details about the new server software are contained in the section "AppleShare for 040" later in this article.

Database and DAL. As part of its CeBIT announcement, Apple said that is working with Oracle and other relational database vendors to support relational databases for the Workgroup Server 95. Oracle is soon expected to announce the release of ORACLE7 Server for A/UX 3.0.1 to fill this need.

Additionally, Apple said the Workgroup Server 95 will support its connectivity language, Data Access Language (DAL). A new product, DAL for the Workgroup Server 95, due in

June, will give DAL-based applications running on either Macintosh or Windows clients access to relational data stored on the Workgroup Server 95.

Upgrades for Macintosh Quadra Owners. Current owners of Macintosh Quadra 900 and 950 computers will be able to upgrade their hardware to the Workgroup Server 95 by means of one of two kits: The first will contain a PDS card with a 128 KB second-level memory cache and the server version of A/UX. The second kit will consist of the first kit's elements plus an internal DDS-DC 4mm tape-backup drive and Dantz Retrospect Remote 2.0 backup software.

Workgroup Server 80

Available by summer, the Workgroup Server 80 is based on the Macintosh Quadra 800, using the same plastics, power supply, and 33-MHz 68040 processor. Designed to meet the file, print, and communications server needs of medium-sized workgroups, it comes with a minimum of 8 MB of RAM (expandable to 136 MB of interleaved memory) as well as built-in Apple SuperDrive and Ethernet and the choice of 500 MB or 1000 MB hard drives.

As with the Workgroup Server 95, the Workgroup Server 80 can be equipped optionally with a CD-ROM drive and DDS-DC 4mm tape-backup drive. Though not as expandable as its big brother, it contains room for three internal storage devices as well as slots for three NuBus cards and one inline 68040 PDS card.

Apple is pushing the Workgroup Server 80 as being ideal for communications. It can support the AppleTalk Internet Router as well as SNA, X.25, or X.400.

System and Server Software. The Workgroup Server 80 employs System 7.1 and the soon-to-be-delivered AppleShare 4.0. Both the system and server software are preinstalled on the server, making it easy to set up and use.

WORKGROUP SERVER 60

Also due in the summer is Apple's entry-level Workgroup Server 60, based on the Centris 610 "pizza-box" shaped plastics, power supply, and 33-MHz 68040 processor. (The Centris 610 has recently received a top price-performance rating from Ingram Labs; see our story on page1.)

Aimed primarily at providing file and print services for classrooms and small workgroups of up to 20, this server provides eight built-in ports for peripherals, one slot that can contain either a NuBus or PDS card, and an optional CD-ROM drive. It ships with 8 MB of RAM (and can be expanded to 68 MB), Apple SuperDrive and Ethernet built-in, and either a 230 MB or 500 MB hard drive. Like the Workgroup Server 80, it ships preinstalled with System 7.1 and AppleShare 4.0.

Jim Groff describes its use: "Out of the box, under $3000 (U.S.), plug it into the wall, turn it on, give it a system name. Bam! You've got a file server. Nice system."

APPLESHARE FOR 040

As mentioned earlier, the announcements in Hannover included two new versions of AppleShare, AppleShare 4.0 and AppleShare Pro, optimized for use with Apple's 68040 computer systems.

AppleShare 3.0 remains part of Apple's product line for use with Macintosh systems that use processors other than the Motorola 68040. The older version of AppleShare is also for smaller networks, supporting 120 users logged on concurrently and up to 15 highly active users.

AppleShare 4.0, for use with the Workgroup Server 60 and 80, improves on that capability, supporting up to 150 users logged on and 30 highly active users at a time. When it's installed

on a Workgroup Server 60, it gives the server the two-times-better I/O performance than AppleShare 3.0 mentioned earlier; on the Workgroup Server 80, I/O is three times as fast. AppleShare 4.0 will be released this summer along with the Workgroup Server 60 and Workgroup Server 80; it's anticipated that it will come installed on the new servers.

Apple calls AppleShare Pro—server software for the Workgroup Server 95—its "flagship" server software product, and it has every reason to. It offers industrial-strength performance, supporting 200 users logged on and 50 highly active users at once and running four times as fast as the older AppleShare, thanks to the Workgroup Server 95's hardware acceleration and the power of its A/UX operating system.

And don't forget, AppleShare Pro is still in the Macintosh family. Even though it employs the high-performance features of A/UX, it maintains the intuitive System 7 interface, making AppleShare Pro both powerful and easy to set up, use, and administer.

MORE TO COME

That's the story from ESD and Hannover, but it's only the beginning. Apple has ambitious plans for its servers and services; you'll read about them here along with more technical details as the plans and products are available. ◆

STRATEGY
Enterprise Systems Division

Expanding Market Share in the Business Computing Market

By Paul Dreyfus

The most important news from Apple this month comes out of its as-yet least-heralded division, Enterprise Systems Division (or ESD). ESD's profile is quickly changing, though, with its announcement at CeBIT of Apple's new servers and network services and with some soon-to-be announced new products that we think Macintosh developers will be very excited about.

What's behind all the hubbub? A well-thought-out strategy to make Apple a serious contender in the business and institutional—small, medium, and large—computing markets. This month *Apple Direct* spoke with the key architects of that plan.What follows is a high-level snapshot of Apple's enterprise systems strategy to provide a picture of how the Workgroup Servers, PowerOpen, AppleSearch, and the other new ESD offerings fit together.

It's a snapshot that developers of many kinds can get excited by. ESD's goals include bringing both new users and new uses to the Macintosh. Much of the ESD story is a cross-platform one, enabling the Macintosh to reach into every major computing environment and making Macintosh a compelling option for businesses that haven't yet committed to Macintosh.

For Macintosh developers, this means that ESD's efforts will help them sell to a wider market and develop new kinds of products. In addition, ESD's plans will help make Macintosh an increasingly attractive development platform to those who don't yet develop for it.

Cross-Platform Development Tools. Additionally, ESD's goals are to make development of client server applications more efficient, both for Macintosh-only and cross-platform efforts. Included in ESD's current work is the evangelizing of third-party efforts to design development tools for cross-platform client server applications.

This is good news for developers building client server business applications, such as those to handle customer service, inventory, and distribution,

applications that usually require integrating the Macintosh into other environments. With these new tools, developers will have a far easier time building “network awareness” and interoperability into their applications. In the words of Morris Taradalsky, vice president and general manager of Apple’s Enterprise Systems Division, “In a nutshell, what we’re about is providing the easiest to use, install, manage, administer, develop, and configure client server solutions for both Apple and non-Apple-oriented platforms. Our mission is to focus on a very broadened definition of what we call client-server computing. To us, client-server computing will include networking; it will include client-server-oriented platforms, tools, and interoperability.”

N&C and A/UX merged. ESD will accomplish this mission by developing technology and products in five key areas. None of these areas were completely ignored by Apple in the past, but ESD brings a new spin and greater ambition to each of them. For those who have followed Apple reorgs closely, ESD was formed by combining two formerly unrelated groups, A/UX, which developed Apple’s implementation of the UNIX operating system, and Networking and Communications (N&C).

Before the formation of ESD, A/UX and N&C had the goal of supporting Macintosh sales; profits for their own products were less important than helping adoption and sales of the Macintosh.

ESD: A Profit Center. ESD, as a separate division of Apple Computer, is a profit center, expected to show substantial returns on its own investments in R&D and sales and marketing. Taradalsky puts it directly: “We have a business proposition for Apple that puts quite a bit of profit back to the company in a very short period of time. This brings us dollars to fund R&D, to expand from being a Macintosh-only business, and to stay competitive.”

Each of the five areas of ESD is expected to contribute to the division’s overall success by creating new markets and brand new business opportunities, some of them distinct departures from Apple’s previous strategies.

SERVERS AND SERVICES

The first of these areas is servers and services, a new business for Apple approached in a new way. Its goals: to create a new server hardware business for Apple and to provide state-of-the-art, innovative services to run on Apple’s (and others’) servers.

The Workgroup Servers, new versions of AppleShare, and the exciting new AppleSearch product discussed elsewhere in this issue (see stories on pages 1 and 5) are the first fruits of this effort. For now, their sales will be targeted to the current installed base of local area networks made up mostly of Macintosh computers; such LANs currently number in the hundreds of thousands. Soon, Apple will use its servers story—performance parity, ease of use, and economy of ownership—to go after the rest of the LAN installed base (several million) and to significantly expand that base.

Server Markets. Server and Services Senior Director Jim Groff explains: "Long-term, we're in the server business to be a leading player with a major market share. But when you enter a new business, it's always easier to sell a new product into an existing market rather than selling a new product into a new market.

"So the strategy is to start by taking our first server technology into the markets we already serve well—publishing, classrooms, small business, departments of large businesses, Mac-mostly workgroups—and serving those needs very, very well," Groff continued. "As we move into next year and we add RISC-based servers to the equation, then we improve our cross-platform story and start selling outside the traditional Mac-LAN market."

What does this mean in dollars? Taradalsky compared Apple to Compaq, 20 percent of whose total revenue comes from file servers. "Server-based systems totalled about 2 percent of Apple's business last year," he estimated. "If servers were a similar percentage for us as they were for Compaq, we'd be selling about $1.5 billion a year in that area alone."

Video Servers? Part of the servers and services story will be the development of entirely new kinds of network services and servers to deliver them. Recently, Apple executives have declared video server technology as an important near-term direction for the company. Groff confirmed both video and image server technologies are areas of interest within ESD, although no product announcements were made as part of the March server roll-out at CeBIT.

INTEGRATION ARCHITECTURE

You'll soon be hearing a lot more about a new model for computing that Apple is pioneering called "client-client-server." This relates to Apple's three-part business strategy: The first, "mobile client," refers to mobile computing devices, such as PowerBook computers and personal digital assistants (for example, Newton). The second, "desktop client," means Macintosh desktop computers. "Server" represents the Workgroup Servers and all the products to be delivered by ESD's first key area, just discussed. A fourth part of the story is the network services and development tools that tie these three parts of the model together.

(For more on the client-client- server model, you'll want to attend next month's Worldwide Developers Conference [see story, page 3] and/or watch *Apple Direct.*)

The second key area for ESD has to do with providing the infrastructure needed to build this model, the technologies and products that enable communications and collaboration between all the devices in the client-client-server architecture. This involves ongoing development of the AppleTalk network system and related technologies, such as AppleTalk Remote Access, as well as connectivity languages and tools like Data Access Language.

Especially for Client- Server Developers. It also includes an area of particular interest to developers, especially those who develop custom applications for enterprise networks: evangelizing the creation of powerful information-system (IS) development tools. For over six months, ESD has been working with a variety of tools vendors to provide industrial-strength development tools for the Macintosh that can be used effectively by teams of people to deliver client- server applications with the Macintosh look and feel that work across many platforms.

Given that until recently, few such tools have been developed, this is an opportunity for Apple and other developers, and Apple has been working hard to take advantage of it. For traditional shrink-wrapped commercial applications development, last year Apple and Symantec announced the Bedrock initiative, a partnership between the two companies to deliver a Macintosh-Windows cross-platform development framework that will one day supplant MacApp.

Tools Vendors. Doing its part, ESD has announced agreements with more than 15 tools vendors over the past six months to create tools in the IS, client-server arena. The vendors, who have agreed to support core Macintosh

technology with their IS tools, include Blythe, Brio Technology Inc., Component Software, Connectivité, Digitalk, Inc., Forte Software, Inc., Mitem, Powersoft, TGS Systems Ltd., and Visix. (A future issue of *Apple Direct* will provide more details about Apple's IS tools evangelism.)

John Nauman, senior director of the ESD Integration Technologies group, which oversees IS tools evangelism, says "These are tools that let developers write a client-server application once and have it work across a variety of platforms." These platforms include Macintosh, DOS, Windows, and UNIX.

CROSS-PLATFORM CONNECTIVITY

The third key element of ESD's focus is what Morris Taradalsky calls "cross-platform connectivity." He explains: "It's wonderful to have connectivity to provide interoperability among all of Apple's platforms. You also have to connect all of our systems to other platforms and systems."

Work in this area provides connectivity from Apple computers into the various industry connectivity standards—IBM, DEC, TCP/IP, and OSI.

You may have heard of products that this part of ESD has already released, including Data Access Language for AS/400, a new token ring card, and the SNA•ps (Systems Network Architecture protocols and services) gateways. ESD's cross-platform connectivity engineers are also responsible for delivering on the part of the Apple/IBM alliance that delivers products to provide more seamless interoperability between the two companies' existing systems.

Nauman, who heads up both ESD's integration architecture and cross-platform connectivity areas, sums up the work taking place in the two areas: "Over the past several years, we've done a very good job connecting the Macintosh into all the key environments. The message that's come from customers for quite some time has been, 'That's fine, but I want to sit down and write applications that take advantage of client-server capabilities, and I want to write them once for different platforms.' So the importance of IS tools cannot be overstated. We can plug into anything now. It's the ability to develop applications that really is the critical issue for Macintosh in mainstream business."

OPEN SYSTEMS

ESD's fourth area has as its goal extending the reach of Apple technology to a much broader base, particularly the traditional UNIX "open systems" arena, currently a $9 billion market. Says Open Systems Senior Director Bruce Cleveland, "We want to drive Apple's operating system—its APIs, services, and networking—into a variety of new environments we haven't had access to in the past."

In essence this means bringing the Macintosh OS into the UNIX workstation market and designing a new UNIX-based OS with a Macintosh look and feel to provide a standards-based system for the business market. It also means taking the Macintosh look and feel to other platforms (the goal of one Open Systems group actually called the Cross-Platform Software department).

For developers, this is primarily a market-share story. ESD's Open Systems group has as its objective nothing less than bringing Macintosh ease-of-use and flexibility to a large share of the market previously dominated by the UNIX operating system. Recent statistics indicate that there are currently 7 million UNIX users—not a bad market to get a share of.

To join Apple in this new market, developers just have to keep doing what they've done so well for years: write great applications that play by the "rules" in *Inside Macintosh* and the rest of Apple's technical documentation. The products Open Systems delivers are intended to let Macintosh software run on a variety of new platforms.

You'll be hearing a lot more about this effort, including some rather earth-moving developments. (Again, stay closely tuned to this channel for more.) For now, there's plenty of excitement already.

PowerOpen. Taking the most recent development first, Apple, through ESD, took part in forming the PowerOpen Association dedicated to delivering a fully operational version of IBM's powerful UNIX OS, AIX, with the ability to run Macintosh applications. This new operating system, known as PowerOpen, will run on Apple's next-generation, RISC-based PowerPC Macintosh computers along with traditional Macintosh system software. It will also work with IBM's RS/6000 line of RISC-based computers. This means that Macintosh applications will not only run on the Macintosh, but also on the IBM RS/6000 (!). (For more details on the PowerOpen Association and PowerOpen, see our page 1 story.)

A/UX 3.0. A year ago, ESD released A/UX 3.0, its implementation of UNIX for the Macintosh. Although it's but a shadow of Apple open systems technologies to come, A/UX 3.0 brings the power and flexibility of UNIX (as well as its myriad applications, tools, and utilities) to the Macintosh, making high-end Macintosh models serious options for buyers in the workstation market.

Taligent and ESD. Additionally, part of the Open Systems group's charter is to work with the Macintosh System Architecture Division to build "Pink," Taligent's object-oriented operating system of the future, into Apple strategy. (For more on Taligent and how it's fitting into Apple's plans, see story on page 10).

VITAL

The last but (to use the cliche) definitely not the least area of focus for ESD is VITAL, a blueprint for enterprise networks that interconnect computers from the many different platform providers. VITAL (Virtually Integrated Technical Architecture Lifecycle) does not comprise any products; rather it describes an architecture for building cross-platform, client-server corporate applications.

Morris Taradalsky explains: "VITAL is an extraordinarily important initiative for us because it's a major communicator to the IS community—the people who do development in-house and have to deal with very complex work environments built originally on dumb terminals connected to mainframes.

"VITAL is a technical architecture, a product-independent road map that explains how IS folks can develop client-server systems using new technologies and have them coexist with, fit into, evolve from existing systems.

"It's amazing to watch the IS folks during a session when they've never heard of VITAL. As it's explained to them, you can see them suddenly open their eyes and engage in what they're hearing about because they can relate to the issues VITAL addresses. I think it's just incredible."

VITAL started off as Apple's own in-house initiative to integrate its own multiplatform IS efforts (incidentally when Taradalsky was vice president of the Apple Information Systems and Technology group). Now it's blossomed into an industry-wide effort to standardize information systems. (For a description of VITAL, see the July 1992 issue of *Apple Direct*.)

TAKING BIG BUSINESS SERIOUSLY

Servers and services, integration architecture, cross-platform connectivity, open systems, VITAL—an ambitious plateful of technical initiatives and new business plans, but one that's bound to make the world of business computing take Apple—its computers and the applications that run on them—quite seriously.

Taradalsky sums it up this way: "In a way it's unfortunate that our name is Enterprise Systems Division, because very often we get immediately niched as, 'oh, you guys deal with large companies and large networks; you're the mainframe kind of people.' That's not true. Most of our business is done in the small business or K-12 and higher education markets."

"But I think in the end Enterprise Systems is a good name," says Taradalsky. "It shows our commitment to big business even though, in fact, the solutions we're bringing to that market will play even better in the other markets." ◆

ShopTalk

Localization Tools

[Editor's Note: Starting this month, ShopTalk will regularly highlight tools Apple provides to developers to support the technical side of their business. The first column tells you about some of the support Apple provides to aid software localization.]

Can your Macintosh product be marketed globally? If so, you can more than double your potential customers: At least half the Macintosh computers sold each year are used outside the U.S.

A chart in Apple's *Guide to Macintosh Software Localization* presents another perspective: Nearly 4 billion people use 27 writing systems in their daily lives today. Of those users, approximately half use Roman writing systems such as English, French, and German, and half use non-Roman systems such as Arabic (200 million), Cyrillic (300 million), and Chinese (800 million). If people have benefited from your product in its native form, it's likely that people using other writing systems would also use it.

Many worldwide Macintosh users are multilingual and thus able to use an application in its native form. However, given a choice, users prefer and select software that supports the writing system most familiar to them. The more your application reflects a language system and culture, the more likely it will be used by your targeted local
market.

World-ready" applications are easier to produce for the Macintosh, thanks to System 7.1's built-in support for complex writing systems. Macintosh Toolbox calls, together with localized system resources, handle the most difficult challenges—tasks like generating text from keypress combinations, sorting characters, and formatting dates, times, and numbers according to a writing system's requirements. The Text Services Manager allows you to create input methods and adds inline input for your applications. TextEdit processes text correctly for all Apple-supported writing systems, letting you use multiple writing systems and font attributes within a text window.

The new Japanese Language Kit, introduced to developers on *Bright Bytes, Big CD,* this month's Developer CD (see CD Highlights on page 3), contains

system extensions and fonts for supporting Japanese text on a Macintosh running a non-Japanese version of System 7.1.

The key to straightforward localization lies in your application's fundamental structure: All your user-interface details should be in resources, separate from the program itself. That makes it easier to localize and test both system resources and your application's resources. You also need to define your application's resources from a global point of view. For example, allow for text fields that accommodate two-byte characters and design your dialog boxes to work with different writing directions. Be careful not to use the full length of any string data structure; it can grow.

Apple provides a variety of documentation to help you localize your products. *The Guide to Macintosh Software Localization* covers these and other design guidelines, as well as localization levels, Macintosh international system software and scripts, script-related Toolbox operations, system resources, localization tools, cultures and writing systems, and character sets, fonts, and glyphs. With its descriptions, handy reference tables, and bibliography of resources, it's a localization "must."

The "Worldwide Software Overview" chapter of *Inside Macintosh* Volume VI is another place to read about fundamentals. You'll find Script Manager, International Resources, and other Macintosh localization tool descriptions in several of the original *Inside Macintosh* volumes. This information is being updated and combined into the new Inside Macintosh: Text volume, available from APDA and technical bookstores this summer.

Two other manuals, *Macintosh Worldwide Development: Guide to System Software and Localization for Japan,* are available from APDA. And look for the article "Writing Localizable Applications" in Issue 14 of *develop* next month.

As far as actual localization tools go, you can use resource-editing tools such as ResEdit and Resorcerer to localize strings, icons, and text layout. DeRez and Rez are versatile resource decompilers and compilers for the MPW platform that let you edit all resources.

AppleGlot, available on this month's Developer CD [path—Tool Chest:Localization Tools], is another important localization tool. It extracts strings from your application into a text file. After you localize the text file, it places the translated strings where they belong in your application. AppleGlot can use glossaries to help automate the translation. If a string in your application matches a glossary, AppleGlot automatically replaces it with its translation.

Because AppleGlot also tracks how your application was localized in the past, it can identify strings that need translating for a revision. The new AppleGlot version 2.0, available on AppleLink and the next “Tools & Apps” Developer CD, has improved string-matching capabilities and also lets you batch multiple files for translation at one time, as the illustration that accompanies this article shows.

Apple also provides other resources and services to help you localize your products. Most international keyboards are available to U.S. developers through Apple’s Developer Hardware Purchase Program for compatibility testing. Localized versions of Macintosh system software are collected on the new quarterly System Software edition of the Developer CD Series. Utilities such as System Picker let you designate different international System Folders so you can test with different system versions on the same hard disk. System Switcher allows you to select a primary script from your installed secondary scripts. ShowDialogBoxes can be helpful for testing your localized dialog and alert-box layouts. (Note that Localizer, the Roman system resource installer mentioned in *Guide to Macintosh Software Localization,* is no longer supported.)

The Localization Verifier (an MPW tool) lets you record whether each resource can or shouldn’t change, so you can identify in a last-step verfication whether resources such as code resources were changed inadvertently.

These are some of the current tools for designing, translating, testing, and verifying your application for worldwide distribution. Check the APDA Tools Catalog, as well as other Macintosh catalogs and magazines for third-party localization tools not mentioned here. And look for the article “Writing Localizable Applications” in Issue 14 of *develop* next month.◆

Editor's Note:
A New Force

Just about a year ago, I went to an off-site marking the completion of A/UX 3.0, the latest version of Apple's implementation of UNIX. (I'd been on the team responsible for producting the literally thousands of pages of documentation for the product.) It had been a hugely complex, exhausting project, but we weren't only blowing off steam from the project just-ended but also laying the groundwork for the next.

We were hearing about what to me sounded like some pretty wild stuff: there were details about how we were going to implement Apple's recently announced agreement with IBM to combine both companies' UNIX systems into a new operating system. The system was to be called PowerOpen, which would, essentially, put the Macintosh look and feel on top of IBM's AIX to run on RISC-based computers from both companies. (Note: Power*Open* is *not* to be confused with Power*PC*; PowerPC is the RISC chip being codeveloped by Apple, IBM, and Motorola to be used in next-generation personal computers.)

We were also hearing about a new, radical idea: to deliver products that would put the Macintosh interface on other UNIX systems so Apple could reach the vast technical workstation installed base. Given Apple's traditional care with the Macintosh operating system, the idea struck me as far-fetched, if not impossible, but I had to admire its ambition.

Around the same time, flip charts started appearing around Cupertino's De Anza 3, the home of Apple's fledgling Enterprise Systems Division (ESD), counting down the days until shipment of another ambitious product: a powerful hardware file server that employed yet another version of A/UX as well as a tuned-up AppleShare, Apple's file and print server software. Many just couldn't believe it; we were dead beat from A/UX 3.0 and now we were all going to rev up not only to do another software release, but also a hardware product and a CPU at that. Good luck, I thought.

"Oh ye of little faith…," as the man said. Here we are, a scant year later, and Apple is just days from delivering that hardware server and the new versions of A/UX and AppleShare to go with it (see page 1). Two follow-on products and yet another member of the AppleShare family have been promised for this summer.

Equally, if not more, noteworthy (at least to this writer): ESD is now talking openly about those “far-fetched” plans for getting the Macintosh interface into the workstation market. Apple’s business and education computing unit participated in the formation of the PowerOpen Association last month (again, see page 1) and ESD is on the verge of making those plans a reality in other ways, as well.

In other words, in an impressively short period of time, ESD has become a force. aggressively driving its products with a coherent, no-nonsense strategy. Other new units might have taken much longer to organize, let alone release products, but ESD has been driven right from the start.

According to ESD VP and General Manager Morris Taradalsky, that’s at least partly because of the demands of the market. People who buy computer sytems for small-, medium-, and especially big-business and education have to know their vendors’ plans, for one, two, even five years. A business computer purchaser isn’t likely to make a big purchase unless assurances can be made that products bought today will be supported, even improved, tomorrow.

Today’s businesses are looking for systems with cross-platform capability, with power, with flexibility, with the ability to function in networks connecting a variety of kinds and sizes of computers and employing any of a number of multiple networking protocols, with long-term affordability. Increasingly, the business market is looking toward “open systems,” standards-based (read: UNIX) hardware and software. Such systems are being viewed as the next computing step beyond DOS/Windows, so dominant in the business today.

With products developed by ESD, Apple is filling those needs and adding its traditional ease-of-use spin. It’s our message that, with Apple hardware and software, business and educational computer users will have everything, and, in some cases, more than they can get from other vendors, but with it they also get the Macintosh experience. That translates into time saved and increased productivity, both of which mean a higher bottom line for business, a smaller budget for schools.

Apple’s story for the business and education markets is one to take to the bank. That story, already a coherent one thanks to ESD’s ambition and hard work, will be fleshed out in the coming months as Apple continues to advance its three-pronged strategy of delivering mobile computers, desktop computers, and clients that all play together easily and seamlessly, not only by themselves but with other computers, as well.

What can developers do? Watch *Apple Direct* closely: there are more than a few new things coming up, and coming up soon. And continue to write applications, peripherals, cards, and other products that adhere to Apple's guidelines; our new initiatives are to be the vanguard of the entire Apple development community, with the Macintosh leading the way into new markets followed by an army of Macintosh software and hardware products.

Paul Dreyfus
Editor

Apple Prepares for Worldwide Developers Conference

Beginning on May 10, more than 3,000 Apple developers, engineers, managers, and industry luminaries will convene at the Worldwide Developers Conference (WWDC) in San Jose, California. At this five-day event, Apple Computer will roll out a detailed plan that shows how recent product and technology announcements fit together and where they'll lead. This conference will give you a chance to look at these developments from a broader perspective, so you'll be able to pick the best course for your company's future.

"With the scope and pace of change in the industry right now, it's important for all of us that we use the WWDC as an opportunity to share Apple's long-range strategies with our developers, then listen carefully to their feedback," said David Nagel, senior vice president and general manager of the Macintosh Software Architecture Division and the Advanced Technology Group.

This year's WWDC will feature

- the technology framework that will enable your products to work with Apple's desktop, mobile, tool, and server products
- how to take advantage of the addition of a RISC-based architecture in the Apple Macintosh product line
- how Apple is extending System 7—including technical details on Apple's upcoming collaborative, scripting, and graphics technologies
- how to get the most out of today's development tools and use Apple's upcoming cross-platform development tools
- the latest Apple developments in new paradigms such as pen-based computing and speech
- development opportunities in enterprise, mobile, and multimedia markets

Technical sessions are the main attraction of the conference, offering you valuable product information and programming advice. In response to feedback from the last conference, the WWDC will include more in-depth technical sessions than ever before. With over 100 sessions, this is the closest thing you'll get to a Vulcan mind-meld on the latest Apple technologies. We'll also host hands-on technical labs where you'll be able to get advice on your specific development projects.

Many developers find that the most valuable aspect of the WWDC for them is the relationships that they develop during the week-long conference.

“The WWDC is an investment in relationships. It’s the only place where developers can have freewheeling discussions without nondisclosures, and where you can talk directly to Apple engineers,” said Ty Roberts, creator of Lightsource’s Ofoto scanning software.

There’s still time to preregister for the conference if you haven’t done so yet—just fax or mail in a registration form by April 23. If you miss this deadline, you can also register on site at the San Jose Convention Center beginning Sunday, May 9, at 4:00 P.M. Call the WWDC Hotline at (415) 705-8050, or contact your local developer support group if you have questions or need a registration packet. ◆

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Eric Shapiro of Rock Ridge Enterprises, the multimedia developer who created VideoBeeps, said, "It's a great place to find a publisher for your software and get advice from Apple evangelists."

Preregister to Avoid Long Lines. There's still time to preregister for the conference if you haven't done so yet—just fax or mail in a completed registration form by April 23. If you miss this deadline, you can also register on site at the San Jose Convention Center beginning Sunday, May 9, at 4 P.M.

Call the WWDC Hotline at (415) 705-8050 if you have questions or need an extra registration packet.

**********Chart**********

The Worldwide Developers Conference 1993 Agenda

This year there will be more than 100 sessions, grouped in four different technology tracks: The Macintosh Desktop, Servers and Services, Mobile Computing, and Tools. For immediate access to conference session descriptions, look on AppleLink in the Developer Support folder [AppleLink path: Developer Support: Developer Services: Apple Information Resources: Developer Events: 1993 Apple WWDC—Apple Developers]

<<Use schedule chart from March conference mailer—it shows what days of the week each technology area will be discussed. (Paul—I faxed you a copy to the fax machine in Shirley Staas' area and I'm also mailing you the Pagemaker document that contains the chart)>>

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CD Highlights

Welcome to *Bright Bytes, Big CD.* The May issue of the Developer CD Series is the first Tool Chest edition (formerly called the Tools & Apps edition). It's loaded with outstanding utilities, tools, and applications to assist you in the development process. The "What's New on This CD" folder also contains exciting new contributions, such as KanjiTalk 7.1, the Japanese Language Kit, and several new chapters of *Inside Macintosh.*

Let's take a closer looks at what's available on *Bright Bytes, Big CD.*

TOOL CHEST

Looking in the Tool Chest folder (formerly the Tools & Apps folder) at the top level of the CD, here's some of what you'll find.

Qwertytunes: This small application lets you send MIDI information into the MIDI Manager using the alphabetic keyboard. This can be used to control sequencers, or MIDI devices directly. It allows you to define the pitch and velocity for each of the 40 keys, including the number keys, 1 through 9 and 0.

MacsBug for 68LC040: This version of MacsBug is for 68LC040-equipped machines, that is, Macintosh Centris 610 and some Centris 650 models. It is provided on an "as is" basis until an official release becomes available. It features a myriad of commands for assisting in the debugging of Macintosh software and also allows users to add their own custom commands.

Rinaldi Collection: This folder contains a wide variety of HyperCard XCMDs and XFCNs, both in French and English. These expand the capabilities of HyperCard by adding many external commands and functions.

StopXPP dcmd: The StopXPP dcmd attempts to close all open AppleTalk Session Protocol (ASP), and thus AppleTalk Filing Protocol, sessions with an asynchronous closeAll call to the .XPP driver.

FsID: This collection of useful programs lets you do more with AppleShare and file sharing. *UnmountIt* lets you unmount disks when they are shared with file sharing *without* turning off file sharing. *Remote Server Control* lets you turn your

file server on or off from *anywhere* on an AppleTalk network. *AppleShareSetup* lets you bypass AppleShare attention dialog boxes and turn various features on or off in the AppleShare chooser extension.

MCL 2.0 Collected Works: This folder contains two bug-fix patches to MCL 2.0 and also a large amount of MCL code contributed by our users. In addition, there are tutorials and discussions of various LISP-related topics.

AppsToGo: This is a development framework, prototyper development tool, and sample applications.

Thomas (Dylan/Gambit): Thomas is an experimental implementation of Dylan, an object-oriented dynamic language (OODL). Thomas allows exploration of an early prototype of the Dylan language. MacGambit is a high-quality scheme interpreter/compiler with on-line help and it's a useful tool for exploring the power of dynamic languages. All source code is included.

Data Access Language Client 1.3.7: This client version of the Data Access Language allows users to access data from mainframe computers in a standard format.

vuCollect: vuCollect works with Virtual User to gather information from an application undergoing testing. It will format the output of Virtual User's matching statements to allow the user to copy or paste when developing scripts. This updated version works with Virtual User 2.0.

Thread Manager: The Thread Manager is an operating system enhancement that allows applications to make use of both cooperative and preemptive multithreading within an application context on all Macintosh platforms.

NEW MATERIALS

Now for news about what's included
in this month's "What's New on
This CD?" folder. Remember, the latest new materials from all three content

focus areas (system software, tools, and technical documentation) are included here.

Japanese Language Kit 7.1: The Japanese Language Kit is a System 7.1 extension that adds support for Japanese to any system—not just KanjiTalk. It is compatible with KanjiTalk 7.1 and includes two Kanji TrueType fonts as well as the Kotoeri input method. This is a final candidate release for developer compatibility testing.

Other New System Software: Also look in the “What’s New on This CD?” folder for both KanjiTalk 7.1 and the final version of Simplified Chinese 7.1.

MacBinary: The MacBinary-Standard and MacBinary-II-Standard are the definitions of the MacBinary protocols. These will be of interest to folks implementing MacBinary in their communications or file compression packages.

MacBinary II Conf is the dialog of those defining the MacBinary II standard. It is interesting if you want to know how the MacBinary II protocol evolved from the original MacBinary. Answers to questions regarding implementation can also be found here.

BinHex: This is the definition for the BinHex 4.0 Protocol. It will be useful for folks interested in adding BinHex 4.0 to their communications or file compression packages.

Developer University Course Info: Developer University offers a broad range of Macintosh programming courses and materials that meet professional developers’ needs for understanding the latest technical directions from Apple. This course information is for January through June 1993.

Developer University Demos: These are demos of three self-paced courses offered by Developer University: Macintosh Programming Fundamentals, Intro to Object Oriented Programming, and AppleTalk for Programmers.

Inside Macintosh: Two new books have been added to the *Inside Macintosh* collection: *QuickTime* and *Text.* The *QuickTime* book describes how to integrate

time-based data (such as video and sounds) into your application and compress and decompress image sequences. It includes the Movie Toolbox and the Image Compression Manager.

Text explains how to draw characters and lines of text in any font, size, and style. It describes how to write applications that can format, sort, search, display, print and accept input of text in any language supported by the Macintosh.

Stay tuned next month for the Technical Documentation edition of the CD, which will include nearly 500 MB of documentation, technical journals, standards, training, and Apple program information.

Sharon Flowers
Developer CD Project Manager

AppleSearch Presents New Opportunities

AppleSearch is a software “engine” that gives new meaning to the phrase “information at your fingertips”—and delivers it, too, along with useful implementations of software agents and personalized newspapers. For developers, the AppleSearch engine provides a platform from which they can build powerful, innovative applications.

The Enterprise Systems Division (ESD) of Apple introduced AppleSearch at the CeBIT Computer Fair in Hannover, Germany, on March 25. All the AppleSearch products, including two developer kits, will be available in the summer of 1993; pricing has not been set.

AppleSearch is both a group of software products and a new technology. It allows you to specify a set of keywords and be returned all the documents anywhere on your network that contain those keywords. Based on your preferences, AppleSearch can return the relevant documents rated (with one to five stars—see figure) by how well the documents match the query, or it can supply you with a “newspaper” that contains the relevant documents.

Here are the various pieces of AppleSearch:

• *AppleSearch Server.* In essence, this software turns a user’s network into a searchable, on-line library of documents. The AppleSearch Server scans the network in the background, indexes the text inside all the documents, and then stores those indexes for future use. This pre-indexing ensures that, regardless of the network’s size, the AppleSearch Server will be able to process a query quickly.

The AppleSearch Server will index every document for which there is an XTND file-format translator. This means that you need to be sure that AppleSearch users have an XTND translator for your products’ documents. Even if your applications’ documents aren’t mostly text, you will still want to have XTND translators for them. Wouldn’t it be great, for example, to search spreadsheet and presentation files for documents that contain the word *earnings?*

Apple will publish the API (application programming interface) for the AppleSearch Server program. This will give you the opportunity to create front-end client programs that can search the network using AppleSearch.

The AppleSearch Server requires a Macintosh Centris or Quadra computer or any of the newly announced Apple Workgroup Servers and at least 8 MB of

memory. (It also requires some version of System 7, which these computers have anyway.)

• *AppleSearch Client.* This is the client program from Apple that lets users make queries. As stated earlier, the user can get a list of documents, rated by relevance, that match the user's criteria. Alternatively, the user can tell AppleSearch to do a search automatically (for example, every weekday at 7 A.M.), organize the results into a newspaper format, and place the resulting file in a specified folder. This program requires any Macintosh running System 7 or later and having at least 4 MB of memory.

• *AppleSearch Newspaper Format Developer's Kit.* This product, which will be available from APDA this summer, will give you the software and documentation you need to manipulate the personalized-newspaper way of displaying documents.

• *AppleSearch Client Developer's Kit.* This product, which will also be available from APDA this summer, includes the AppleSearch Newspaper Format Developer's Kit. It will also add the software and documentation you need for manipulating the AppleSearch Server from within your application.

For your information, the first release of AppleSearch will not work with the Easy Open technology that Apple introduced recently, but the second release will. *Apple Direct* will give you more information as it becomes available. If you're attending this year's Worldwide Developers Conference (May 3–7, in San Jose, California), AppleSearch technology will be discussed in the session on text search and retrieval. ◆

Update From Taligent

“Objects may be closer than you think.”

That’s what Taligent President Joe Guglielmi told the Software Publishers Association (SPA) Symposium in March during his keynote address, even though completion of Taligent’s object-oriented system (code-named “Pink”) appears at least two years away.

Although Guglielmi had few specifics to report that affect the Apple developer community, he painted a very attractive picture of how Pink will make life easier for developers in the not-too-distant future.

One point to keep in mind is that, even though Taligent is an Apple subsidiary (it’s owned jointly by Apple and IBM), its view of the world will differ from Apple’s. Taligent hasn’t yet specifically announced how ubiquitous it expects Pink to be, but the vision for Pink is that it would one day run on every major platform and provide the potential for running any application.

Apple is optimistic about the promise behind Pink and the potential development efficiencies an object-oriented system can present. Currently, strategists in Apple’s Enterprise Systems and Macintosh Systems Architecture divisions don’t foresee that Pink will replace Macintosh System 7 or its successors; instead, the Pink system will be one option for users of future Apple hardware.

Guglielmi stressed that the object-oriented system will lead to “dramatic improvements” in application development and that it will “unleash innovation.” He also said that it will “put the fun back into it” since programmers will be able to focus on writing great applications rather than “plumbing that keeps things running.”

This will be attained by building the system in parts that Guglielmi called “frameworks.” Each framework will be a class of objects focused on one function, for example, networking. The frameworks will fit together into the whole system; when developers want to write an application, they can change the framework that needs changing, which can then be fit back into the whole.

Guglielmi said, “With Taligent, developers will work on only one part of the system, not the whole thing. They’ll just have to work on the part of the object code that needs to be changed to solve the problem.”

To see just how efficient their development environment was, last year Taligent engineers wrote several Pink applications. One of these was

approximately the size and complexity of Claris's MacDraw®. Guglielmi noted that the Claris® application took several hundred thousand lines of code and several years to develop. The Pink equivalent took several thousand lines and several months to write.

Guglielmi said that Taligent will employ Apple's model of relying on developers to provide great applications for the new system. Additionally, Pink will employ adaptors and bridges to be sure current technologies work with it, so current investments in hardware and software won't be lost.

Pink is ultimately intended to run on every major hardware architecture, although Taligent will initially be targeting Apple and IBM hardware. This means, theoretically, that developers will need to write their Pink applications only once and they'll be able to run as is on a multitude of different platforms.

Pink is still in the prebeta stage. Guglielmi hopes to reduce the normal new-technology acceptance curve from five to seven years down to two to three years. Taligent will attempt this with staged release of its software. They'll focus initially on the development environment so that others can move their technology into the Taligent environment and import Taligent's into their own.

In the near future, there will be a small validation program involving a limited number of carefully chosen developers. Taligent expects to release documentation about its operating system, followed by a software development kit. ◆

Hot Products of the Month

Special introductory offer!
AppleScript Software Development Kit Bundle

Build AppleScript into your applications
to support custom solutions for your users.

Get in on the scripting revolution with this special offer.
Order the AppleScript Software Development Kit
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AppleScript is Apple's powerful new scripting system that works across applications and networks to deliver automation, customization, and application integration capabilities for the Macintosh.

AppleScript will make custom application development faster and easier because commercial applications can be used as components with AppleScript acting as the "glue" between them.

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- Increases the value of your products–Apple is making scripting an integral part of the
  Macintosh computing environment.
- Positions you to take advantage of emerging technologies like speech recognition.
- Lets you expand into new markets–Apple is opening up new business markets that will.
  demand AppleScript-compatible products.
- Allows for customization–AppleScript will allow your products to accept functional add-ons.
- Reduces time to market by allowing your applications to be combined with other packages.

- Creates a cross-platform scripting foundation.

Special Offer

AppleScript Software Development Kit Bundle Offer

This special bundle contains both the AppleScript Developer's Toolkit and the Apple Events/AppleScript Programming Tutorial. The AppleScript Developer's Toolkit is designed to help you build AppleScript support into your applciations.

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Now Available From Apple

The following list shows APDA products that have become available to developers within the last several weeks. To get a full listing of all APDA products, check the current *APDA Tools Catalog.* For new product announcements and the most up-to-date price lists, check AppleLink (path—Developer Support:Developer Services:Apple Information Resources:APDA—Tools for Developers).

Apple Products

Tools

AppleScript Developer's Toolkit version 1.0
R0175LL/A
$199.00

AppleScript Runtime Kit
version 1.0
R0460LL/A
$20.00

Apple Multimedia Information Mailings—New Subscription (PAL)
R0494LL/A
$400.00

Apple Multimedia Information Mailings—New Subscription (NTSC)
R0495LL/A
$400.00

Author's Solution for Interactive Electronic Books (Level I)
R0492Z/A
$125.00

Author's Solution for Interactive Electronic Books (Level II)

R0493Z/A
$350.00

Introduction to VITAL: Designing Information Systems for the 1990s
L0189LL/A
$5.00.00

APDA
Top Ten Sellers

1. E.T.O. Starter Kit
2. MacTCP version 1.1.1 Developer Kit
3. Macintosh Programming Fundamentals version 1.0.1
4. QuickTime Developer Kit version 1.5
5. Macintosh Common Lisp 2.0
6. *Inside Macintosh: Macintosh Comm Toolbox*
7. MPW C/C++ Disk Bundle version 3.2.3
8. Get Started in Macintosh C Programming
9. MacApp version 3.0.1 CD Bundle
10. DAL Toolkit for the Macintosh

Ordering Information

To place an APDA order from within the United States, contact APDA at (800) 282-2732; in Canada, call (800) 637-0029. For those who need to call the U.S. APDA office from abroad, the number is (716) 871-6555. You can also reach us via AppleLink; the address is APDA. If you're outside the United States, you may prefer to work with you local APDA contact. For a list of non-U.S. APDA contacts, see the "International APDA Programs" page in the *APDA Tools Catalog.*

Developer University Gets Great Marks From Developers

Developer University (DU) is a customer-focused training organization designed to provide programming and development professionals with a full range of programming courses for Apple technology and tools. DU's current offerings include a full range of procedural and object-oriented programming courses, System 7 extensions such as AppleScript and AOCE, and new architectures such as QuickDraw GX. DU is also developing new courses in Bedrock, PowerPC, and AOCE.

DU surveys developers each year to determine how well our customers are being served. We look at what each set of customers requests, find out whether our current courses meet developers' training needs, measure overall satisfaction with our services, and determine what new courses developers would like to have. We use the survey information to structure our curriculum and course offerings for the following year. 1992's survey resulted in an impressive 99 percent positive satisfaction rating.

In 1992, DU added a new focus to our annual survey. We asked developers to measure the way DU trainings had affected their productivity. The results were compelling:

- 99 percent of developers who have taken training agree that DU's training helped them learn a new topic faster. They estimate that they saved an average of 5.3 weeks of learning time.
- 94 percent of developers agreed that the DU training reduced their time to market for the software they were developing by an average of 5.4 weeks.
- 87 percent indicated that the training helped them adopt a new technology faster, saving an average of 7.7 weeks.

If you add those savings up over an entire project, DU's training can provide overall savings of as much as 18 weeks in a development cycle. Translate any one of those savings to dollars, and the investment in training these developers made has more than paid off.

Some of the products and programs that came as a direct result of developer requests include our ground-breaking line of self-paced courses, short mini-courses on new technologies (such as Apple events and AppleScript and the forthcoming PowerPC tutorial), and the formation of the DU Extension program,

which will provide more field training in key curriculum areas. DU has also increased its participation in new technology seminars and is working in close coordination with Apple's development teams and Evangelism.

You have an opportunity to help us shape our curriculum and programs for the next year. At the 1993 Worldwide Developers Conference, we'll be conducting another survey at the Developer University booth.

If you're at the conference, stop by, take the time to think about how DU could help you and your organization's development efforts, and give us your input. You won't go unheard.◆

It Shipped!

Through the It Shipped! program, you can announce new and revised third-party products in *Apple Direct.* It Shipped! listings are also made available on the 3rd Party Connection AppleLink bulletin board. You can obtain an It Shipped! application by downloading it from the AppleLink network (AppleLink path— Developer Support:Developer Services:Apple Information Resources:Developer Program Information:It Shipped! @ Program), contact Chloe Freeland at (408) 974-8974 (voice) or (408) 974-7084 (fax).

Once you've completed the application, send it to Engineering Developer Support Center, 20400 Stevens Creek Blvd., M/S 75-2B, Cupertino, CA 95015, Attn: It Shipped! Program. Or send it by AppleLink to It.SHIPPED!.

Publisher	**Product (version)**
Abbate Video, Inc.	VideoToolkit 2.0
Dantz Development Corp.	Retrospect 2.0
DEMCO, Inc.	Science CAP 2.0
Expert Software, Inc.	Expert Draw 1.0
MacVONK•International	FileTime 1.0
Nystrom Publishing	MacGuides: Special Places for the Discerning Macintosh Traveler 1.0
Pixel Pathways	Expansions 1.1
Working Software, Inc.	Toner Tuner 1.0
Concurrent Engineering Tools, Inc. (CETI)	Sum Total 1.00
Ungerman Engineering, Inc.	UEI MacJack 1.0
Eccentric Software	A Zillion Kajillion Rhymes
Systemsoft America, Inc.	Shade II 1.4.2

Toolbars

By Peter Bickford

Dear Doktor,
We're developing a new data analysis program, and thought that it might be useful to include some way for users to get at commonly used functions. Lately, we've been noticing several programs that use a "toolbar" across the top of the screen with icon buttons for the various program functions. This seems like a promising approach to handling our problem, but we can't seem to find any guidelines for using toolbars. Do you have any that you could provide us with?

We were wondering in particular about a couple of problems we've been having. The first problem is that many of our functions are hard to represent using icons. Even such basics as "Save" are proving surprisingly difficult to create good icons for. Are there any standards or places where we could look for icons such as these?

We were also wondering if there was some sort of maximum number of icons that should be added to the toolbar. Currently, we're going back and forth between having just a few user-selectable icons (which seems cleaner to me), or using up all the available space with as many predefined icons as will fit (which the programmers seem to be leaning toward). Do you have any information in support of either direction?

Thanks for your time,
Lada Smirnov

Thanks a lot for the thoughtful letter, Lada. However, since merely answering your questions would leave me some 1000 words short on my column this month, please allow me to first ramble on a bit about the underlying question of button versus menu interfaces in general. I promise I'll get to the specific answers eventually….

On the Strengths of Button-Driven Interfaces

Once upon a time, I was called on to design a kiosk system. Having never designed one before, I asked my fellow interface designers for tips. One veteran designer had this disturbing advice: If you want people to be able to use your

system, don't use menus—not even pop-up menus. The reasoning: Menu commands are hidden unless you know enough to click on the menu.

Long-time Macintosh user that I was, I couldn't believe that anyone could ever have a problem with something as basic as a menu. Of course, after watching user after user fail using my menu-driven kiosk prototype, I eventually got the message and replaced my menus with buttons and my pop-up menus with radio buttons. As soon as I made the switch, my usability problems vanished.

Lest you think this only applies to inexperienced users, consider the case of AppleLink. Before AppleLink 6.0, AppleLink users used menu commands for addressing memos, sending mail, and adding enclosures. AppleLink 6.0 added small buttons to the memo windows as another way of accessing these functions.

About a year after the release of AppleLink 6.0, we did some user testing as part of developing AppleLink 6.1. One of our more interesting discoveries was that every single person we tested preferred using the new buttons for addressing and sending mail and for adding enclosures. Newer users were often surprised that these functions could even be performed using menu commands. But we were really surprised that not even the power users used the menus, despite their familiarity with them and the fact that the menu commands in question all had Command-key equivalents.

The moral of these stories is that users tend not to search through a menu looking for a command, when an icon to do the same thing is staring them right in the face. If you want to impress your friends by dropping cognitive psychology terms on them at parties, you'd say that buttons are more manifest than menus—they are noticed more easily, and as a result, tend to be used more. It's this quality that's behind the growing popularity of toolbars—which essentially are big collections of highly manifest buttons as opposed to big collections of not-so-manifest menu commands.

BUT ON THE OTHER HAND...

But if toolbars have this great advantage over menus, why haven't toolbars become a universal standard on the Macintosh? These are some of the reasons:

- Displaying icons takes up valuable screen real estate. Many users, especially users of compact Macintosh computers, don't have any real estate to spare.

• As Lada mentioned, coming up with good icons to represent commands is a real problem. Although international standards organizations have been working hard on this problem for decades, the results have been decidedly mixed. Even such basic commands as Save are hard to show in a way that will be clear to all users. It only gets worse when you try to represent a spreadsheet's Fill command, or the database command Reload Tables From Host Computer.

• Because it's impossible to overshoot the menu bar when moving the mouse to the top of the screen, it's actually easier for users to choose items such as fonts from a regular pull-down menu than it is to choose them from a toolbar.

Finally, the very "manifestness" of the buttons in a toolbar can lead to that terrible condition known as cognitive overload. That's another psychology term that basically means you feel like your head's going to explode from all the junk people are throwing at you.

AND THE MAGIC NUMBER IS...

Research seems to show that the most icons or symbols a user can handle at once is about eight. Having no better explanation for this number, I'd assume that it derives from the beloved "magic number" of seven, plus or minus two (± 2), that people are able to store in short-term memory at once. The theory goes that if you are presented with about seven or fewer pieces of information at once, you'll be able to work with them all simultaneously. Any more than that, and something usually gets lost.

The "magic number" explains why phone numbers are easy to remember, but driver's license numbers are not. It also explains why you can never remember all of the ten things you were supposed to pick up at the store on the way home.

The only way around this limit seems to be to "chunk" information together into seven or fewer groups. Social security numbers, for instance, are separated by dashes for exactly this reason. That way, people can easily "chunk" a number like "098-98-9082" into three easily remembered groups, while they'd have a much harder time remembering 098989082. Chunking is also a wonderful way to win at games like "Simon": To double your score, simply remember the sequence as pairs of digits, instead of single digits. Thus, the hard-to-remember "1, 3, 1, 4, 2, 1, 1, 4, 4, 2" can become the much easier "13, 14, 21, 14, 42."

Gaming strategy aside, we can apply these same concepts in the design of our interfaces. For example, we should probably limit a given application to having 7

± 2 menus, each consisting of
7 ± 2 commands. And, if we need more items under a given menu, we use dividing lines to allow users to “chunk” the items into groups.

Likewise, we can extend the number of toolbar items a person is able to deal with effectively by grouping similar items. For instance, icons for aligning text left, right, and center effectively become one group when placed together. On the other hand, they would be considered three separate items if these icons were interspersed with unrelated functions like Create Table or Print.

SOME GUIDELINES

So, at last, we near the end of this month’s column. Looking back, I see that I’ve covered everything from the relative manifestness of menus and buttons to considerations of cognitive loading, all while touching only mildly on the reader’s question. (Perhaps I should consider entering the next presidential debate!)

So then, without further ado, here are my proposed guidelines for using toolbars:

- Always provide a way for users of small screens (or those who just don’t like toolbars) to hide the toolbar.
- If a command can be performed using a toolbar, it should also be able to be performed using the menus.
- If there’s any doubt about what a toolbar icon represents, give it a label. And definitely add Balloon Help for every toolbar item.
- Keep the number of toolbar items small. In terms of numbers, eight or under is optimal, and twenty is definitely pushing the upper limit. If you’ve got as many buttons on your toolbar as you do on your universal remote control at home, you’ve probably got trouble.
- Group related items with each other.
- Consider letting users choose which items go in the toolbar. That way, they can get to the four commands they really want without searching through twenty icons that they rarely use. And no matter what you do, don’t force the user to have twenty icons in the toolbar if they only want a few.

Till next time,
—Doc
(AppleLink: THE.DOKTOR)

GetNextEvent

The “**” indicates the trade shows/events at which Apple Computer, Inc. is scheduled to exhibit as of press time. This list may be incomplete. If you have information about a show that you want listed here, contact Developer Technical Communications, 20525 Mariani Avenue, MS 75-3B, Cupertino, CA 95014. For further information check the Events folder on AppleLink (path—3rd Party Connection:Events).

May 2 through 5
****MacIS Conference**
San Antonio, TX
Contact: Jerry Starr
AppleLink: JERRY.STARR
(408) 974-3836

May 4 through 6
****DB Expo**
San Francisco, CA
Contact: Russ Havard
AppleLink: HAVARD1
(408) 974-4371

May 6 through 10
Abacus
Milan, Italy
Contact: Luisell Vaghi
AppleLink: ITA.EVENTS
39-2-273261

May 10 through 14
****WWDC**
Worldwide Developers Conference
San Jose, CA
Contact: WWDC Hotline, Paul Hease
(415) 705-8050

June 3 through 5
Apple Expo
Lyon, France
Contact: Catherine Massot
AppleLink: FRA.PROMO
33-1-6986-3620

June 5 through 8
**CES
Consumer Electronics Show
Chicago, IL
Contact: Eliza Lape
AppleLink: ELIZA
(408) 974-1248

June 8 through 10
**Apple Education Consortia
Anaheim, CA
Contact: Daryl Weiner
AppleLink:WEINER1
(408) 974-8566

June 14 through 15
DB World
Boston, MA
Contact: Steve Taglio
AppleLink: TAGLIO
(408) 974-7538

June 17 through 18
German Developers Conference
Germany
Contact: Leo Bonengl
AppleLink: BONENGL.L
43-1-711-8241

June 21 through 23
French Developers Conference
Deauville, France
Contact: Catherine Massot
AppleLink: FRA.PROMO
33-1-6986-3620

June 23 through 25
Digital World
Beverly Hills, CA
Contact: Julie Marquette
AppleLink: MARQUETTE1
(408) 974-3664

June 28 through 30
NECC
National Educational Computing Conference
Orlando, FL
Contact: Sue Collins
AppleLink: COLLINS3
(503) 346-3537

June 29 through July 1
PC EXPO
New York, NY
Contact: Jeryl Gerhardt
AppleLink: JERYL
(408) 974-2368

July, 28 through 31
NACS
Seattle, WA
Contact: Jeryl Gerhardt
AppleLink: JERYL
(408) 974-2368

August 3 through 6

****Macworld**

Boston, MA

Contact: Dave Billmaier

AppleLink: BILLMAIER1

(408) 974-4371

September 15 through 18

****Apple Expo Paris**

Paris, France

Contact: Catherine Massot

AppleLink: FRA.PROMO

33-1-6986-3620

Making Sense of the Glitz

Evaluating Design/Collateral Agencies

By Dee Kiamy,
Apple Direct *staff*

During a product's early life, marketing communications pieces—data sheets, sales brochures, point-of-sale materials, and the other pieces that are usually known as "collateral"—become almost as important to your success as your product's code. You didn't trust just anyone to program your application, and you likewise shouldn't let just any communications firm handle your collateral work. The reason: Along with your other communication efforts—such as public relations and advertising—collateral materials contribute heavily to establishing your company's public image.

Choosing a design firm or agency to handle these critical items can be confounding the first time around. Early in my career, I planned collateral and promotional strategies (often with as many as 40 to 50 projects on the drawing boards at any given time) for the Du Pont Company, and was responsible for choosing the agencies and designers for the jobs.

A steady stream of designers scheduled presentations of their wares, and I soon became dazzled (or was it razzled?) by all their six-color, multifold, scored, perforated, three-dimensional, award-winning glitz. In that overwhelming paper parade, every firm looked good to me.

However, the task of selecting the "right" designers really wasn't so daunting once I realized a simple fact: There was a wealth of information about each firm contained in the pages of its portfolio.

The portfolio is simply a collection of a design firm's creative work, and, together with its client list, is the firm's stock in trade. It is probably the single richest source of information about the caliber of a firm. From it you can glean important information about how the firm does business, the kind and quality of work it produces, the range of services it provides, and its clientele.

When I began asking the right questions about what I saw in the portfolios I reviewed, I broke the code. The result was a much clearer picture of each firm's talents and expertise and, most important, whether it was a good match for my needs. This article is not as much about how to choose the right agency as it is

about how to evaluate what you see and hear while examining a firm's portfolio during its sales pitch.

Before the Show

A portfolio presentation will do no good if it doesn't address your particular needs. So before designers' and agencies' presentations, take a little bit of time to help them prepare to meet with you. Otherwise, you may end up sitting through spiels that fail to deliver the kind of information you need to make a decision. However, a small investment of time up front can help prevent wasting it later.

Ahead of time, the firms you review should understand the general nature of your company, your product, and the communications job you'll need: For instance, is this a new product introduction? Are you trying to break into a new market? Or do you simply need to develop a 90s look for your packaging? If you clearly define your project up front, the agency can prepare better and will be more likely to bring the right items to your first meeting.

Also, by knowing your needs ahead of time the agency can forewarn you if it doesn't offer the particular services or expertise you're seeking. For example, suppose your project involves designing product packaging; if the agency you're considering instead specializes in creating promotional brochures, you'll want to know that up front.

Unveiling Capabilities

The portfolio's contents can reveal a lot about a firm's capabilities, especially if you ask questions to establish the exact nature and extent of the contribution a firm made to the work you see in its portfolio.

Try this test: Choose some brochures or other pieces from the portfolio that you find particularly striking, and ask questions such as these: What role did you play in the creation and production of this work? Did you create pieces from scratch, or did you act as a project manager and contract the projects (or large portions of them) out? Did you come up with the concept? direct the photography? do the writing? manage the printing and mailing? How much did it cost? What was the purpose or use of the piece? What role did the client play in the process? Did the client offer any after-the-fact feedback about how

successful the piece was? Also ask what, in retrospect, the agency would have done differently.

The answers to such questions can help you evaluate whether the agency may have the specific expertise to meet your needs. For example, firms often use existing photography received from clients or licensed from photography "banks." If your project will require extensive original photography, you should be on the lookout for pieces that demonstrate an agency's ability to direct photography. The same applies to copy writing.

In most cases, it's not a negative if an agency didn't do everything from scratch. Being able to draw from a pool of outside talent allows a designer or agency to purchase very specialized talent as needed by a project (such as an illustrator with a specific style or a photographer that specializes in filming certain kinds of products). However, if a firm must subcontract out a lot of the work, you in essence become subject to the subcontractors' schedules. While in principal that should be the concern of the firm you've hired, in practice it doesn't always work that way. How well the firm manages its subcontractors can affect whether it can meet deadlines. So it's important to understand the role the firm played in each aspect of its work so that you get a more accurate picture of its capabilities, strengths, and weaknesses.

As you flip through the pages of a portfolio, ask designers which pieces they are most proud of and why. What do they feel they do best? Ask them to point out examples. You should also inquire if the creative person or team responsible for this work is still employed at the agency. Agencies and design firms tend to have a tremendous talent turnover, and today's creative team (or person) may work somewhere else tomorrow. If a firm consistently produces good work, it's probably able to hang onto its talent, or is good at hiring the right kinds of people, or is well managed—or a combination thereof.

Make sure that when reviewing the portfolio you pay particularly close attention to examples of work that are conceptually or functionally similar to your project. Find out what was involved in producing those pieces—how the agency worked with the client, the approximate budget, how long the project took from start to finish. You'll not only learn more about the agency, but you'll also develop insights into how the designer approaches the creative process and how this approach may apply to your project.

However, even though you may need a specific service, don't ignore the other kinds of work a firm has done. By reviewing a variety of pieces—which can

include direct mail campaigns, promotional brochures, advertisements, corporate image pieces, and so forth—that are representative of the firm's creative range, you'll get a feel for a designer's overall creative range and style.

DISTINGUISHING QUALITY FROM GLITZ

When you examine a portfolio, try to get a feeling for whether the firm can produce quality work on a limited budget. The issue here is distinguishing quality from glitz, *quality* in this case meaning effective design that meets your marketing communications objectives while portraying the right image for your company—without budget overkill. (Of course, there's a difference between shoddy workmanship and quality, budget-conscious—but effective—work.)

From scrutinizing the portfolio's contents you can determine whether a designer or agency can tailor itself to a range of needs and budgets or produces only very upscale (read: expensive) work.

Face it: Sometimes you need a Lexus, and sometimes you need a Hyundai; sometimes you need luxury, and sometimes economy. If your budget is tight, recognizing what you really need for accomplishing your communications objectives, and hiring a design team that can accommodate you, can mean the difference between bringing in a project on budget and blowing not only this quarter's money but also next quarter's—on one job.

Some firms do have a proclivity for producing only expensive work. They prefer to push the creative envelope and develop designs that use the latest and greatest in color, imaging technology, paper stock, and the like. But if they can't (or won't) produce a marketing communications piece that meets your needs within budget, then you should look elsewhere.

For example, your data sheet design probably doesn't have to feature a hologram and be printed in four colors on exotic paper. That's an extreme example, but the point is that many times your collateral pieces need only be "what they need to be" to accomplish your communications objectives. I've seen lots of four-color brochures that, with a little bit of clever, well-executed design, writing, and production, could have been excellent two-color pieces that still met their objectives.

Of course, much of the burden also falls on you, the client, to recognize what's needed to meet your objectives—and stick to it even when the temptation to increase the glitz factor is strong.

Also, remember that the design fee itself is just one portion of the total cost to produce a piece of collateral. Printing, collating, and mailing can also be real budget eaters. Even if a designer's bill is well within your budget, you may still blow your pot of money if the resulting piece requires expensive printing and production; the same is true if the piece is so unusually shaped that it requires special inventory storage (say, in the case of product packaging) or a highly customized mailing envelope (in the case of a brochure, for instance).

Many firms tend to show you only their more glitzy, top-drawer pieces. Showing you only ultra-slick work in the portfolio may be a tipoff to an agency's proclivity toward glitz. However, a firm may simply want to show you "its best." Inquire about it, and probe designers for their viewpoints on the tradeoffs between creativity and communications function. If they try to skirt the issue, that should send up a red flag. Also, ask to see some more modestly produced pieces, too. (Tell designers ahead of time so that they'll know to bring these things to the presentation.)

AND THE WINNER IS...

Speaking of glitz, agencies and design firms are deservedly proud of the awards they've won and will probably mention these kudos when showing their portfolios. Awards can give you important information about the firm, so it's important that when awards are mentioned, you do a little bit of investigating about them. (For more information, see "Awards and Creative Beauty: What's the Real Prize?" below.)

THE CLIENT LIST

The client list is another indicator of what is important to a design firm and the caliber of work it performs. Who a firm works with (or doesn't work with) can give you some clues about whether it may be a good match for you. After reviewing a portfolio you'll probably want to ask for references to a firm's clients. While of course you'll probably be referred to only its happier clients, as you review the portfolio you can also make a mental list of other ones.

You can also note such things as whether the firm focuses on particular-sized companies, and on companies in your industry, other industries, or a mixture. Has the firm worked with your competitors? With companies whose communications efforts you respect or feel have been successful? This kind of information lies within the pages of the portfolio.

UNDERSTANDING A FIRM'S BUSINESS PHILOSOPHY

Finally, the portfolio and tenor of the presentation should give you a sense of what a design company's business philosophy is. It also doesn't hurt to ask such outright questions as "What's your philosophy about client service?" and "What's your business objective or mission statement?" When a firm stammers and stutters and can't directly address the question, you've probably either hit a nerve or the company isn't focused enough to give you a good answer. But if it responds with a well-defined answer about how it prefers to do business, you'll know you're on the right track.

Successful client/agency interaction is as important—maybe even more important—than its creative abilities. Some years ago, I was considering a small but up-and-coming agency for a particularly important job. During the presentation I asked the agency to cite an example of how it had overcome strong client objections to what the agency felt was effective work. The answer prompted me to inquire about the firm's client service philosophy, and the agency responded straight and to the point: "We're here not only to fill your desires, but also to meet your needs."

The agency representatives went on to explain that they preferred building the kind of business relationships in which they wouldn't be relegated to being "yes-men." Although this agency acknowledged that usually what the client wants is what the client gets, it wanted the freedom to point out (diplomatically, of course) the instances when fulfilling our desires was getting in the way of meeting our needs—and to know that we'd listen and accept the input in the spirit that it was offered.

I learned a lot about this firm during that discussion. It (a) was clued in to the need to meet communications objectives, (b) employed people who were likely to be good communications problem solvers, and (c) did some thinking for itself. (By the way, I did hire them; we certainly had some interesting meetings, and the resulting ads and campaigns handsomely met our objectives.)

You can learn a lot about a design firm or agency by closely scrutinizing its portfolio. If you ask probing questions about its work—and read between the lines of what you see—you'll be better able to distinguish which firms are the best ones for handling the creation of your collateral materials. ◆

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Awards and Creative Beauty: What's the Real Prize?

In design, advertising, and public relations there are more award competitions than you can shake a stick at. (This mirrors the TV, film, and music industries; how many awards ceremonies have you heard of or seen recently?) However, it would be a mistake to categorically discount the awards a firm has gathered just because there are so many of them to be won. So, when designers speak about awards, ask which awards they are most proud of and why. Ask to see the pieces of work the awards were for; inquire about the specific accomplishments the awards recognized, who the competitors were, and what the judging or selection process was.

Asking these questions will help you gauge the caliber of a designer's work as perceived by "experts" or peers. It also gives you an opportunity to applaud your potential partner and thus signal that you are interested in its work and would value its particular skills. (A quick aside: Buying a creative service isn't like purchasing office supplies or equipment parts. Instead, you are buying brainpower—creativity—just as you do when you hire programmers, and you should be sensitive to what motivates creative people. Just like everyone else, the agency's artistic team wants to create things that they can show off with pride, and they want opportunities to produce work that speaks well for their talents. They also want to make money.)

On the other hand, beware if a firm unduly emphasizes its long laundry list of awards, because some companies inadvertently produce award-winning art at the expense of accomplishing communications objectives. The real prize, as far as you're concerned, is meeting your communications objectives. What Leigh Marriner said about direct response advertisements in last month's *Apple Direct* article entitled "Selling Off the Page" also applies to almost any piece of collateral or promotion: It shouldn't be art for art's sake.

I think the point is so important that it bears repeating here: The main purpose of a marketing communications piece usually is to promote a product,

not showcase artistic creativity. There's nothing wrong with creating a communications piece that is aesthetically beautiful or unusual, if it achieves your communications objective. But if prospects can't read the name of your product, or are so distracted by a brochure's artistic beauty that they fail to remember what product or company was being promoted, or don't understand the message, you won't accomplish your objective.

Ad agencies or freelance graphics and advertising professionals usually lean toward being highly creative: Their orientation and training are usually geared to creating interesting or beautiful work. However, your agency or designer should be capable of tempering its natural bent toward creativity, artistic trend, and visual beauty with a clear understanding of your marketing objective.

This ability (or its absence) will become apparent as you discuss the portfolio—if you watch for it. Be on the lookout for awards for work that was evaluated on its creative merit as well as how well it met marketing or communications objectives. More importantly, the answers to questions you ask about each piece's communications purpose will give you some of the best hints. For example, if the agencies' responses to such questions are couched in terms of how their brochures met marketing objectives or increased customer inquiries or reached a particular audience segment—something of that nature—it's a sign that they may be clued in to your *raison d'etre.* ◆

The Professional Graphics Market

A Look at the Graphical Elements

By Wendy Weinstein, International Data Corporation

Graphics has always been a strong market for Apple and Macintosh products. In many ways, the Macintosh computers' graphic capabilities helped establish the graphics market as much as the graphics market is responsible for helping the Macintosh become a mainstream platform. Apple has wisely maintained a strong product offering for this market and has continued to improve product platforms, in addition to introducing more flexible software and supporting a large variety of third-party developer relationships. These efforts have allowed Apple to retain its position as a strong choice for the professional graphics market.

This article examines the trends International Data Corporation (IDC) is projecting for the Macintosh professional graphics market. The elements critical to this market include the changes in the hardware used to support the market, including the monitors and boards, as well as an examination of the different types of application software used. In this article, the professional graphics market is defined in two ways: as graphics for the business professional, as well as a tool for the graphic artist (or graphics professional). For the business user, the most familiar example of professional graphics is presentation graphics software. This software supports business (and other) users by providing graphics support for presentations. The professional graphics market also includes the draw and illustration packages used by professional illustrators and graphic designers. While this is a smaller segment of the market, these products drive the sales of the higher-end hardware and related software products.

IT'S A COLORFUL WORLD

With the pricing of color monitors and graphics boards decreasing at the same times that color monitors and graphics capabilities are increasing, professional graphics capabilities are now within reach of the average user. IDC research shows that color monitor markets for the Macintosh are high-growth areas. Apple has wholeheartedly adopted color as the way of the future: New product releases suggest that the primary focus for product development will be color,

and include offerings in the low end—for example, the recently announced color Macintosh Classic® and color Powerbook computers.

Color as the Monitor of Choice. These changes reflect the increased acceptance of color as the monitor of choice among many users, especially with sales of monochrome monitors for the Macintosh market falling 23.6 percent from $123.2 million to $32.2 million between 1992 and 1997 (see Figure 1 below). Large-format monitors, which continue to be a higher-ticket item, are not expected to gain a significant share of the market (IDC uses the term *large-format* to describe graphics boards that support monitors of 16–21 inches). These are more specialized monitors and are more likely to be used by the professional graphics market.

In 1992, IDC estimates that the large-format color monitor market generated $185.7 million in sales worldwide, representing 27 percent of the total worldwide color monitor market. As shown in the Figure 2, IDC estimates that this market will grow to $254.5 million by 1997, showing a growth rate of 9.7 percent, although it represents a net decrease in share of 6 percent as the medium format monitors increase in popularity. During the 1992–1997 time frame, IDC projects that the medium-format color monitor market (15-inch to 16-inch monitors) will grow by a factor of close to 500 from $108.0 million to $529.7 million, and increase its share of the total color monitor market from 16 percent to 44 percent.

The Future of Large- Format Monitors in Graphics. While Apple continues to dominate the 16-inch color monitor market, the market potential for the 24-bit board and high-end or large-format monitors is substantial. This represents a potential high growth area for Apple, its competitors, and the Apple developers. The increasing competitiveness of this market segment will continue to drive prices down and bring in more users. Additionally, IDC expects the small-format graphics board market to mature rapidly; such boards are quickly being replaced by large-format, 24-bit boards (as users move into more high-end products and more sophisticated graphics applications). These products support more advanced color capabilities on the larger format monitors.

As a result, IDC expects that the types of graphics being used in the professional graphics market will show increased sophistication over the 1992–1997 time frame, with expanded color and graphics support (through the use of the 24-bit boards) as well as more complicated applications. IDC is currently

projecting that 13-inch 8-bit boards and 8-bit boards for 16–21-inch monitors will be removed from the market by 1997 (see Figure 3 below). These products will be replaced by large-format, 24-bit board products which offer both increased capabilities and color resolution that jointly provide greater flexibility and support for a broader range of monitors.

GRAPHICS FOR THE BUSINESS PROFESSIONAL

Presentation graphics software is an important component of the professional graphics market because of the high demand by many business (and o*ther) users.* This is a high growth market, with IDC projecting that worldwide sales will almost triple between 1991 and 1996 from $47.3 million to $124.5 million. This leap in revenues is based on a corresponding increase in shipments, which IDC projects to reach close to 1 million units by 1996, an increase from 1991 of 69 percent (see Figure 4 on the next page).

Multimedia and Business Graphics. One of the more critical developments within this market is the continuing evolution toward products that incorporate more multimedia-based characteristics, such as animation engines, embedded audio, and QuickTime video. The inherent differences on both the conceptual (for the end user) and mechanical (storage requirements, network bandwidth requirements) planes between still graphics and multimedia will result in a slow transition to these technologies, with the full impact of multimedia not expected to be felt until 1995 or 1996. However, IDC believes that multimedia will help drive graphics software sales in this period, as the concepts become more clearly understood and the potential of the technologies are ultimately realized. The hardware constraints stated earlier, which continue to impede multimedia sales, should be minimized or eliminated by 1996.

IDC believes that the PowerPC computers (with the added capabilities of RISC) will also contribute to the increase in presentation software sales, although the introduction of the PowerPC products will cause an initial slowdown in software sales around 1994 as Apple begins to make the transition between the traditional Macintosh platform and the RISC-based products. Although Apple has committed to 100 percent compatibility for all Macintosh platforms, IDC expects many users to take a conservative, “wait-and-see” attitude, which will hinder growth in hardware sales. This will also affect software

sales of graphics applications as users hesitate in committing funds to one platform type or the other.

The Presentation Graphics Market Structure. Based on 1991 data, Microsoft dominates the presentation software market with its PowerPoint product, holding a 35 percent share of product shipments, and a 27 percent share of the total revenues. Deltapoint DeltaGraph comes in second in unit shipments, with 18 percent of the market, and third in revenues, with 15 percent of the market. The DeltaGraph product trades places with Aldus Persuasion, which was in the third position in unit sales (14 percent) but, with its higher average system price (ASP), represents 22 percent of product revenues. The market share relationships are expected to continue in much the same manner for 1992: the 1992 midyear market share by revenues show that Microsoft will strengthen its share to 41 percent, at the cost of some of the smaller vendors. Deltapoint DeltaGraph and the Aldus Persuasion products are also expected to maintain their second and third place positions, although the 1992 midyear data shows a stronger Persuasion, with 21 percent of the market. Although the data for the peak selling season for this market is not included in the results, IDC expects vendor market shares to remain relatively constant.

THE DRAW AND ILLUSTRATION MARKET

Beyond the graphics products designed to support the business professional (through slides, video, multimedia—whatever will help the user sell an idea) is the Macintosh draw and illustration market, which covers all packages designed to provide draw functionality, including the high-end products for the graphic-arts community. (The phrase “draw and illustration” is used by vendors to describe products such as Claris MacDraw and Adobe Illustrator.) This market, which is larger than the comparable Windows-based market and commands higher penetration rates than the Windows-based or DOS markets, is characterized by ease of use and strong product functionality. Developments in this market in 1991 were primarily in improved product focus and better commication to users by software developers about product capabilities.

IDC is forecasting that draw and illustration software unit shipments will grow by 24 percent to nearly 1 million copies by 1996 worldwide (from 323,000 copies in 1991), and that worldwide revenues will climb 21 percent from $63.7 million in

1991 to $167.4 million by 1996. The slower revenue growth is directly attributed to a decrease of 2 percent in the average selling price (ASP). During that time frame, the international sales of draw and illustration software will grow to 40 percent of total worldwide sales, while the U.S. share of the market will decrease slightly from 62 percent in 1991 to 60 percent in 1996 (see Figure 5).

The Effect of Low-End Macintosh Computer Sales on the Draw and Illustration Market. The 1991 jump in hardware sales of low-end Macintosh products (Classic, Classic II, LC, and LC II) did not have a significant impact on the draw and illustration market; additionally, the decline in sales in 1992 also had little to no effect. It appears that the primary buyer for this type of software is the mid-range Macintosh (IIsi, IIci, IIfx, Centris and Macintosh Quadra 700) user. Although this segment of hardware products is not volatile, it does demonstrate steady and strong sales. These mid-range products are the core platforms for the business user, which suggests that a link between draw and illustration software and mid-range hardware, although tenuous, does exist. Another reason for such a link is that many of the draw and illustration packages are color capable, and are thus more likely to be used on those hardware products that support color (until recently, the low-end Macintosh products did not support color).

Although the low-end products do not generate high volumes of sales in the draw and illustration software market, the fact that in 1992 low-end Macintosh computers represented over 50 percent of worldwide sales indicates that the low end represents a dynamic market opportunity. The presence of cost-sensitive users suggests that the potential for easy-to-use, functional, targeted products with draw functionality with a street price under $100 is substantial. The comparable market for Windows and PCs is experiencing rapid growth as the most cost-sensitive users enter the market. These cost-sensitive users are leveraging the price war among Intel-based computer vendors, and they are flooding the market with their demands for viable low-end software. The same phenomenon occurred in the Macintosh market with the introduction of the low-end products, which tapped into the cost-sensitive arena. Therefore, there is a window of opportunity for growth in this market between 1993 and 1995, after which time the rapid growth of the low-end Macintosh computers will peak and begin to slow.

Draw and Illustration Market Dynamics. From a vendor's perspective, this has been a relatively stable market. The market consists of two primary high-end players (Aldus Freehand and Adobe™ Illustrator™) and two primary low-end players (Claris MacDraw and Deneba Canvas). Only four developers have strong products and strong market positioning. Both Canvas and MacDraw, although reporting higher unit sales, have lower market shares. In 1990, the two companies commanded 44 percent and 20 percent respectively; in 1991, their shares had fallen to 40 percent and 15 percent.

In 1991, sales of both Illustrator and Freehand climbed, although Illustrator pulled ahead of Freehand in total unit shipments and market share. Illustrator climbed to 22 percent of high-end unit shipments from 15 percent, while Freehand only moved up one point from to 15 percent in 1991. This hints at the shift toward high-end products that the market is beginning to experience. The high-end, until now, has been dominated by Intel-based platforms, although there is an increase in the use of Macintosh platforms in the graphic arts community. Therefore, although Illustrator and Freehand dominate the market, there may be an opportunity for Apple developers to move into this niche market.

THE GRAPHICS MARKET

The graphics market is currently experiencing considerable change. Although the high-end graphics market is somewhat buffered from dramatic changes due to its small size, the addition of more powerful platforms will help software developers create more powerful applications. These will be supported by the more versatile color monitors and boards, which will become increasingly common as the price continues to come more in line with the everyday user.

The low end of the market is also on the verge of rapid change. As the draw and illustration market, in addition to the presentation graphics market, are discovered by low-end users who are beginning to experience the new availability of color monitors, there will be increased interest in the more flexible software. This is a double-edged sword: The vendors need to be cautious about making the software too expensive or too complex for the low end, or too simple for the high end, while at the same time not reducing the opportunity to use the low-end products as an entry into the higher end.

Ultimately, the greater presence of color in the Macintosh environment, with color PowerBook computers, Color Classic computers, and a full rainbow of

options on monitors, will help products in the professional graphics market grow into valuable and possibly even required tools for the business and casual user.

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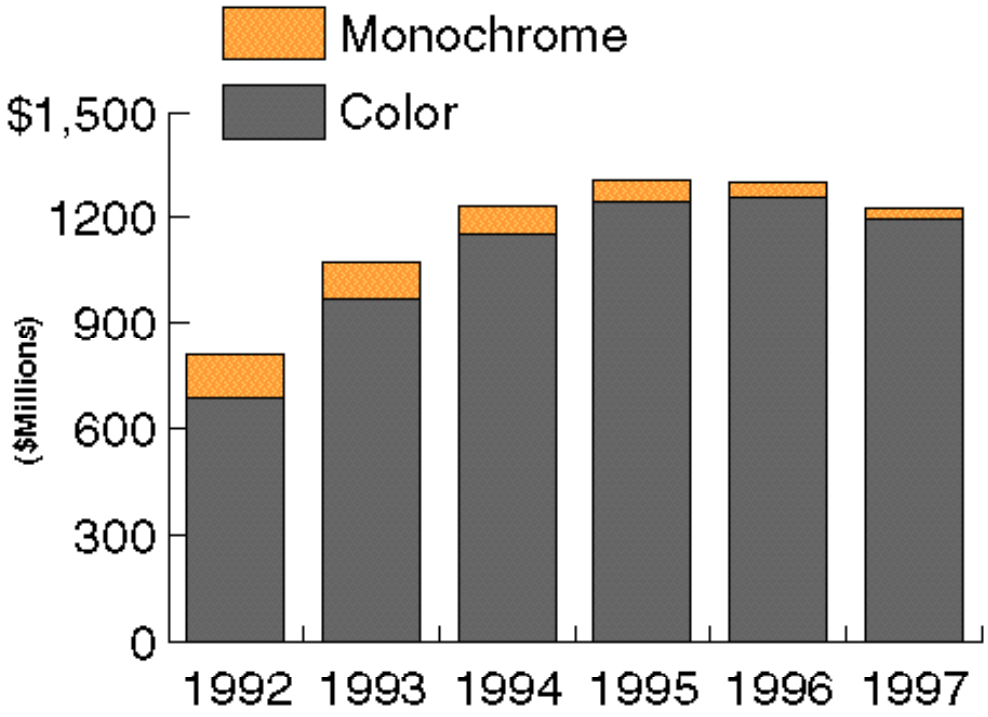

Figure 1: *Worldwide Macintosh monitor market, monochrome vs. color, 1992–1997.*

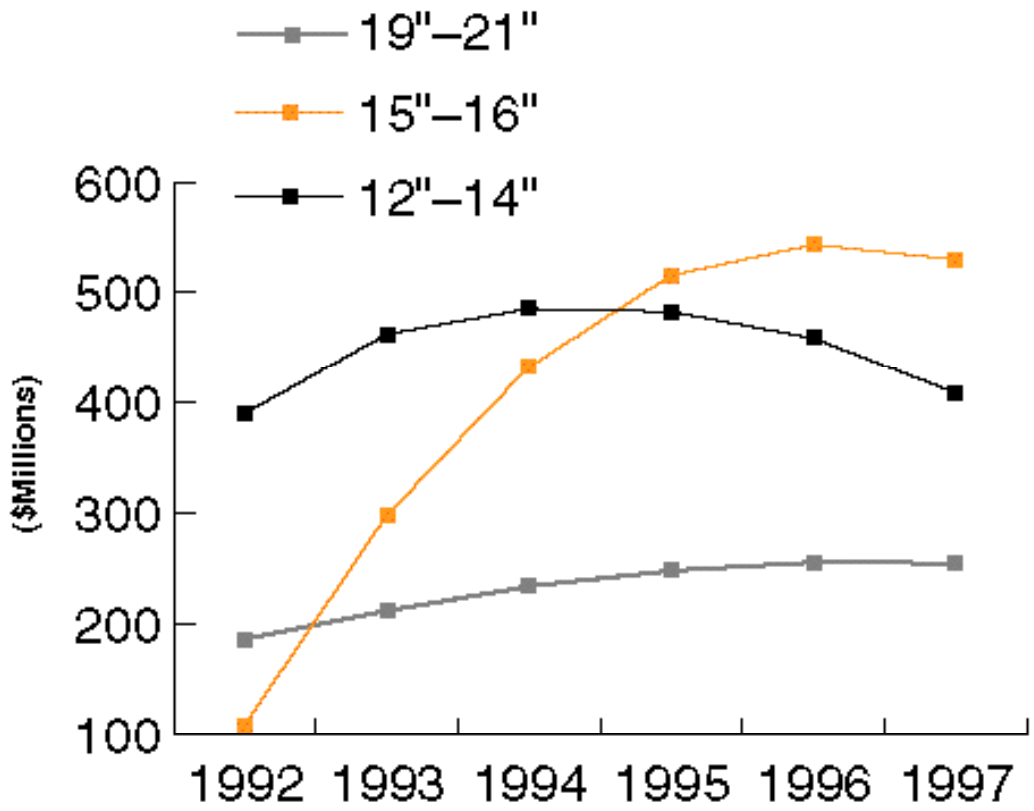

Figure 2: *Worldwide Macintosh color monitor market revenues, by monitor format, 1992–1997.*

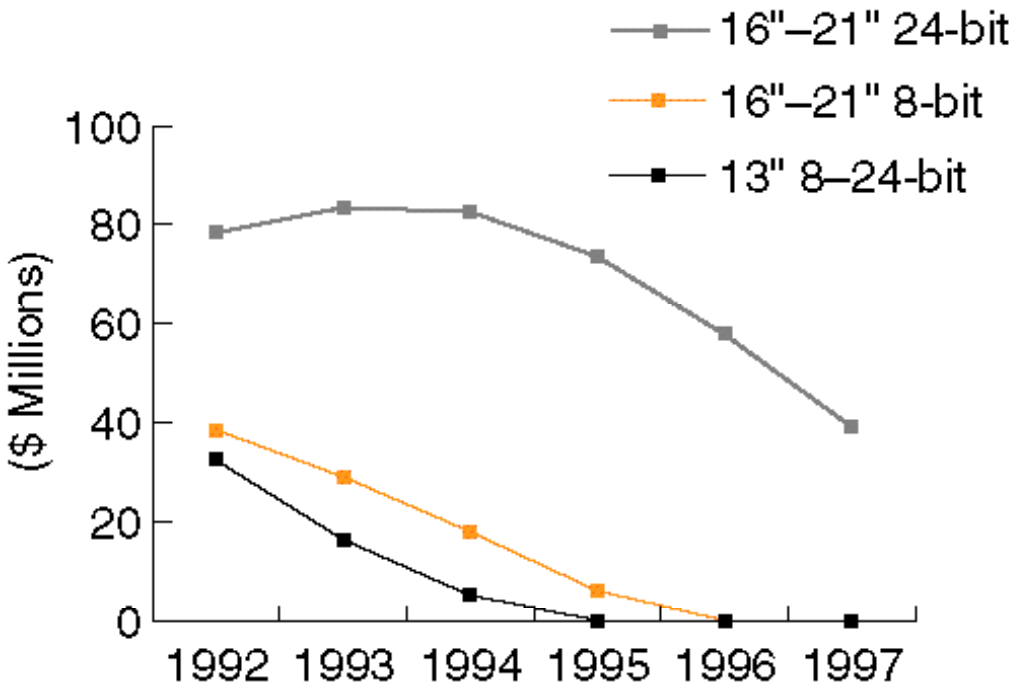

Figure 3: *Worldwide Macintosh graphic board revenues, 1992–1997.*

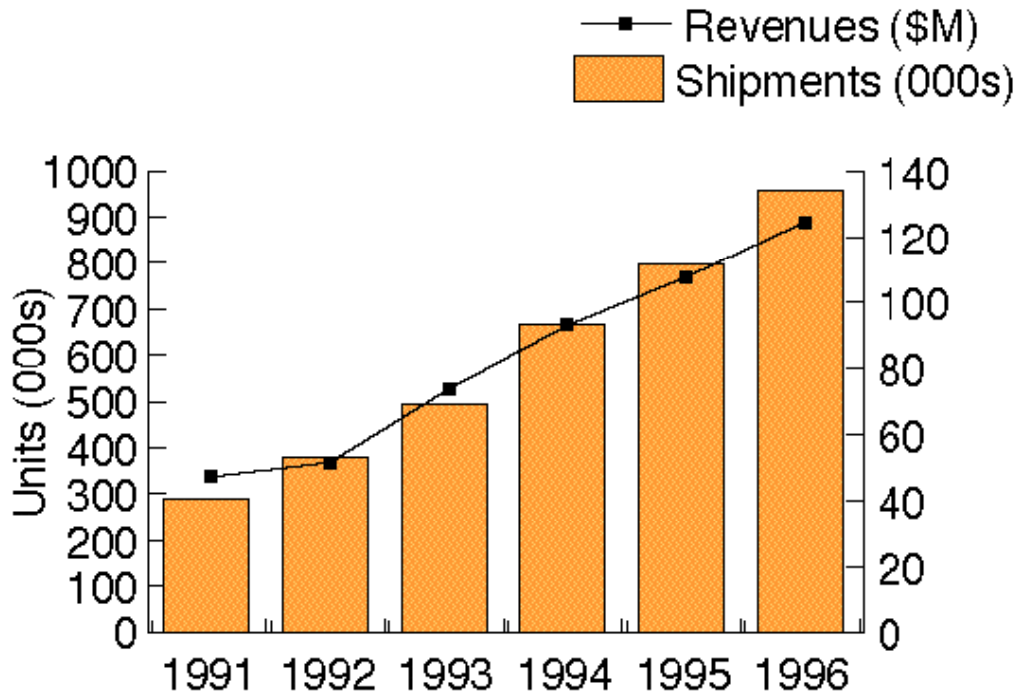

Figure 4: *Worldside Macintosh presentation graphics software market, 1991 –1996.*

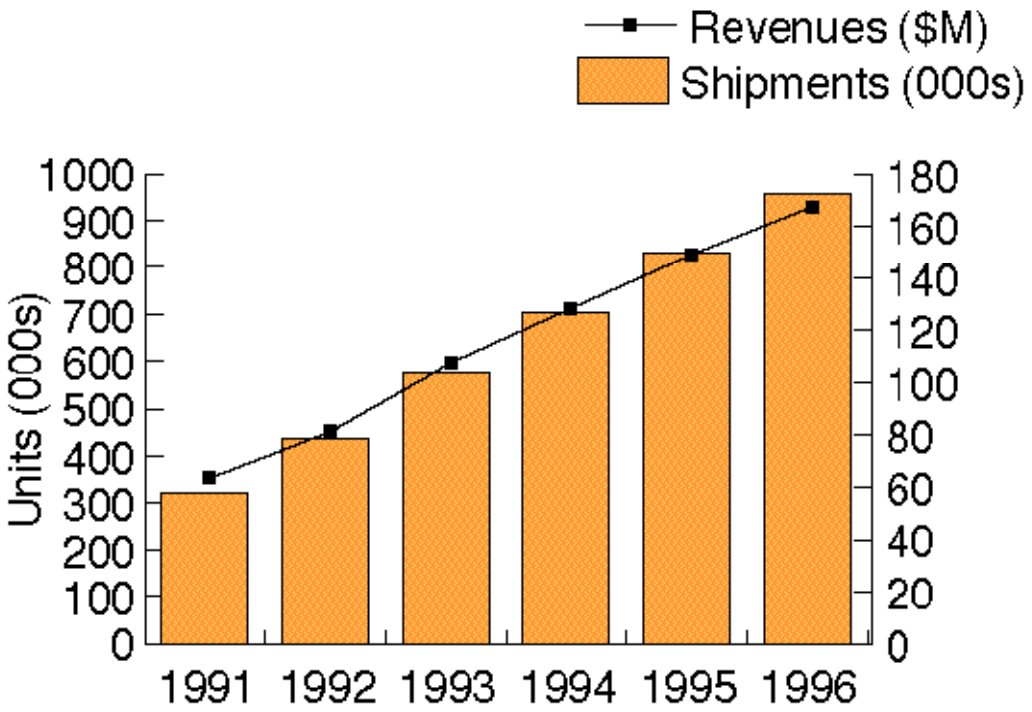

Figure 5: *Worldwide draw and illustration software market, 1991–1996.*

Apple Direct

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