The Developer Business Report

November/December 1996

Mac OS

AppleDirections

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APPLE NEWS

Apple Computer Posts $25 Million Profit

Revenues, Margins, and Cash Flow Reflect Continued Improvement

On October 16, Apple Computer, Inc., announced results for its fourth fiscal quarter (ending September 27, 1996), and Apple's return to profitability two quarters earlier than was previously expected. For the quarter, Apple's revenues were $2.321 billion, a decrease of $682 million from the fourth quarter a year ago but a sequential increase of $142 million from the quarter that ended June 30, 1996. Unit shipments for the quarter were approximately 932,000, a decline of 26 percent from the same quarter a year ago but a sequential increase of 11 percent from the June 1996 quarter. International revenues represented 47 percent of the quarterly total.

Net income for the quarter was $25 million, or $.20 per share, compared with $60 million, or $.48 a share, in the same quarter a year ago. Apple's operating income for the quarter was $34 million, a sequential improvement of $150 million from its $116 million operating loss in the June 1996 quarter. Included in the fourth quarter's operating results was an adjustment of prior period restructuring charges, which reduced pre-tax operating expenses by $28 million. Without this adjustment, net earnings would have been approximately $8 million, or $.06 per share.

Apple experienced continued sequential growth in gross margins and reductions in operating expenses. Gross margins were 22 percent, compared to 18.5 percent in the June quarter, while operating expenses before the

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STRATEGY MOSAIC

Doin' the Java Jump

By Gregg Williams, Apple Directions *staff*

Apple's Java Strategy

Yikes! Java—Sun's language and environment for doing software that is truly portable across platforms—is *hot,* and everybody's doing the Java Jump. It's probable that if you aren't doing Java software, you soon will be—and for some pretty good reasons. And if your response is, "Java means nothing to me," let me remind you of a question you probably asked not too long ago: "So why should my company care about Web pages?"

Seriously, though, Java is an important emerging technology—you should find out more about Java if you don't already know about it—and Apple is committed to making sure that it will be a major player in all things Java.

"OK," you say, "but I'm looking inside my Mac OS–compatible computer, and I don't see any Java. What is Apple going to do to become this major Java player?" That's an important question, and it's one that I will attempt to answer in this article.

Apple's Java strategy has three objectives:

- to ensure that Apple's platforms (Mac OS, Newton, and Pippin) deliver the best Java experience for both users and developers
- to contribute to the evolution of the Java platform
- to integrate Java tightly into Apple system technologies—including the Mac OS, OpenDoc, and QuickTime

The rest of this article explores Apple's plans for reaching these goals, including discussions of the Mac OS Runtime for Java and relevant parts of the recent Apple-Sun alliance (for details, see the Apple press release at

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STRATEGY MOSAIC

Java

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http://product.info.apple.com/pr/press.releases/1996/q4/960918.pr.rel.sun.html).

The Best Java Experience

Apple wants the Java implementation on its platforms—Mac OS, Pippin, and Newton—to be so good that people routinely say, "You've got to deal with Java? Then do yourself a favor—go with Apple. Anything else is just not worth it."

How to Earn a Good Reputation

What does Apple have to do to earn that kind of reputation? First, the Java implementations have to be stable—if the machine crashes while it's running Java code, no one will want to use it.

Second, Apple's implementations of Java must fully comply with the latest version of Java as defined by JavaSoft (Sun's "operating company" devoted to Java); otherwise, some Java code won't work, and we're back to the conclusion of the first point. As a corollary to the second point, Apple must also deliver new Java implementations as soon as possible after each new reference release of Java from JavaSoft.

Apple must accomplish the above two points to provide adequate implementations of Java. However, to gain a reputation for excellent Java implementations, Apple has to do more. Apple is working to ensure that its Java implementations are as fast as possible—users will notice and appreciate the speedy execution of Java code in Apple products. In addition, Apple will work to give the best possible human interfaces to its Java implementations; on the Mac OS and Pippin platforms, this means providing Java implementations that come as close as possible to the Mac OS user experience.

Making Mac OS the Best Java Development Platform

Apple also wants to make Mac OS–compatible computers the best platform for developing Java software. (This includes Java applets—which you usually see embedded in Web pages—as well as Java applications—which are full cross-platform applications written in the Java programming language. In this article, I will refer to both of these, collectively, as *Java software*.)

For you, having a fast and stable implementation of Java is only the beginning. You also need good development tools, and Apple is working hard to ensure that the Mac OS will be the best platform for creating Java software.

Good Java development tools are already available from Metrowerks, Natural Intelligence, Symantec, and other companies. In addition, the Apple-Sun alliance states that the two companies will work together and with third-party companies to bring powerful Java development tools to market.

Pippin

Pippin is a platform for consumer computing devices that Apple licenses to other manufacturers, and each Pippin licensee is entitled to add whatever Java capabilities (if any) it desires to its Pippin-based products. For example, in Japan, Bandai been demonstrating Java capability on its Bandai@ATMARK product since last March.

The Pippin operating system is based on the Mac OS, and its hardware design supports the addition of extra memory, if needed, to run Java and other environments. (The Pippin architecture can support up to 38 MB of total system memory.) Because of this, any Pippin licensee can add full Java run-time support for its products through Mac OS Runtime for Java or whatever other implementation it might choose.

Newton

Apple's strategy for adding Java support to Newton-based devices will begin with adding the ability to run a fast, stable Java run-time

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This issue of *Apple Directions* will be available by November 15 on the Web at http://devworld.apple.com.

engine, thereby allowing Java applets to run within a Newton Web-browser program. Apple plans to work with JavaSoft and third-party companies to make this happen. In addition, Apple expects to add further Java support to Newton devices later on, based on market needs.

Contributing to Java's Evolution

As the saying goes, the best way to predict the future is to invent it. Apple sees Java as a major force in the computer industry, and it wants to contribute to Java's evolution in a way that benefits the industry by keeping the Java environment open and cross-platform and by making it more useful and powerful as it evolves.

Apple has already taken several steps that have influenced or will influence Java's evolution. Here's one example: Apple's expertise in internationalizing Mac OS computers is widely known, but it is not widely known that Apple contributed its internationalization technology to Taligent, back when the company was jointly owned by Apple and IBM. Last August, Sun announced that it was using the class libraries of Taligent (now owned by IBM) to allow developers to "create multilingual applications in Java."

Two other examples of Apple contributing to the evolution of Java come from the Apple-Sun alliance. The first has to do with OpenDoc and Java Beans, both of which are component software architectures. (For details, see the section "OpenDoc and Java Beans," later in this article.) Apple and Sun will work together to ensure that Java Beans and OpenDoc will work well with each other. This joint effort will ensure that the OpenDoc component software architecture will run smoothly within Java.

The second example that comes from the Apple-Sun alliance is that Sun has agreed to enhance Java media APIs and libraries to fully support QuickTime functionality. This will enrich the Java community in two ways. Java developers will be able to incorporate QuickTime data types (for example, video or audio) into Java software. In addition, they will be able to call upon a wealth of QuickTime development experience and content-creation tools.

Finally, Apple and JavaSoft engineers are also working together to ensure that future Java extensions are well designed and meet the needs of Apple's customers and technologies. Areas of joint work include but are not limited to the Java Native Method and Debugging APIs and design committees for Java 2D and animation extensions.

Integrating Java Into Apple System Technologies

Apple has pledged to integrate Java into Apple's system technologies, wherever that makes sense. Earlier, I talked about one provision of the Apple-Sun alliance that would allow Apple's sophisticated QuickTime technology to be accessed through Java programs. Now it's time to talk about how Apple is integrating Java into the Mac OS and OpenDoc.

Mac OS Runtime for Java

Apple is committed to adding run-time support for Java (that is, the ability to run Java software) to the Mac OS and shipping it with every Mac OS–compatible computer. This means that, regardless of how users want to use Java on a Mac OS–compatible computer, they will be able to do so without ever having to wonder whether Java is present. In other words, Java will be an integral part of the Mac OS.

Mac OS Runtime for Java (MRJ) is the software that Apple is developing to implement Java support for the Mac OS. It's not just an idea that Apple is talking about—you can download a working beta version of Mac OS Runtime for Java today from the Web at **http://www.devtools.apple.com/mrj/**.

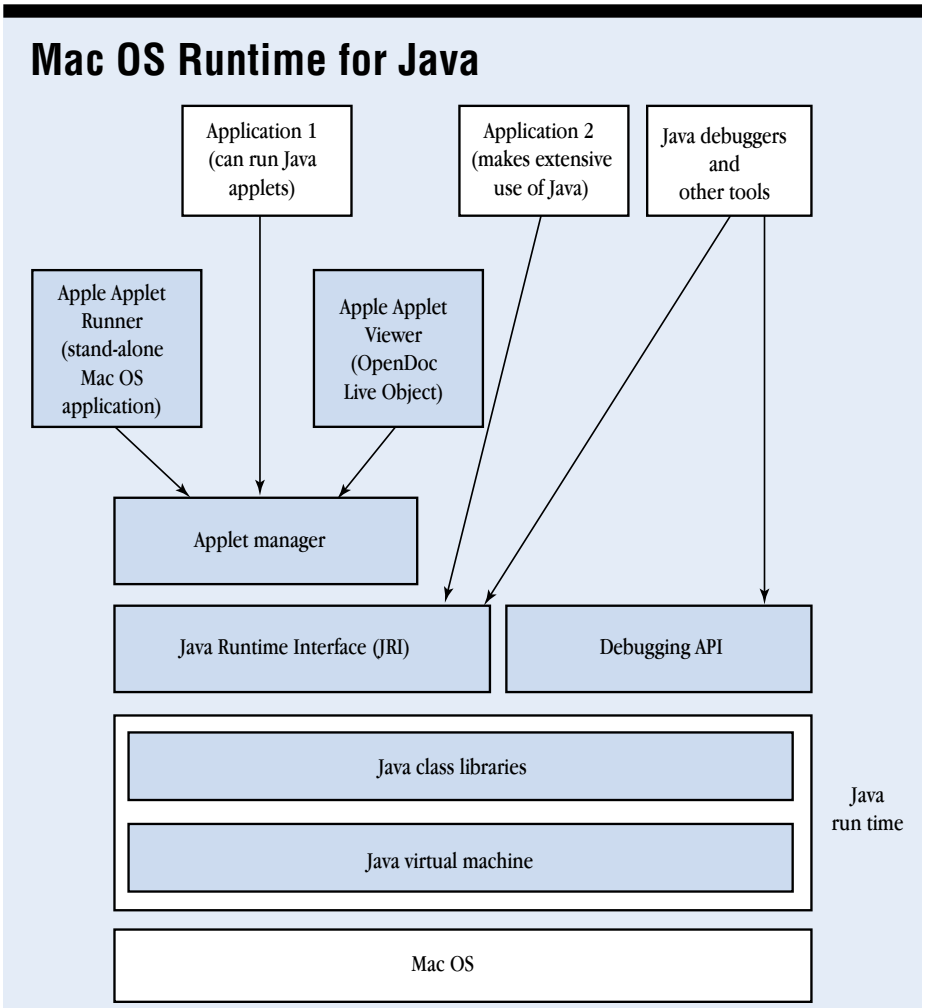
Looking Inside MRJ. Mac OS Runtime for Java is implemented in three pieces:

- The Java run time, implemented as two shared libraries, is the software that actually runs Java software. (See the figure on page 4.) Within the Java run time "box," the Java class libraries implement the Java run time environment. The Java virtual machine executes the Java bytecodes that are a part of any Java software. (The Java virtual machine is also called the *Java VM*—not to be confused with Apple's use of *VM* to indicate its implementation of virtual memory on Mac OS–compatible computers.)
- An invocation API layer makes up the second piece of MRJ. It includes the applet manager, a high-level API that allows Mac OS applications to run Java; the Java Run-time Interface (JRI), a low-level API for invoking the Java virtual machine directly; and the Debugging API, which helps you to write Java debuggers and other development tools.
- Java applet viewers constitute the third piece of MRJ. This piece includes the Apple Applet Runner, a stand-alone Mac OS application that allows users to run a Java applet in its own window, and the Apple Applet Viewer, a Live Object that can run a Java applet anywhere an OpenDoc part can be embedded (for example, in the Cyberdog environment or in any OpenDoc container).

Advantages of MRJ. Currently, every application that supports Java must include its own Java run-time engine (which each one does, with varying degrees of success). This is an expensive process that slows down the development of Java-savvy software; it also limits the number of developers who can create and sell Java-savvy applications.

Mac OS Runtime for Java offers a better solution, for several reasons:

- Through MRJ, Apple is committed to deliver and maintain a stable, standard, high-performance and up-to-date Java runtime system on the Mac OS—so you don't have to.
- MRJ will be part of the Mac OS—that way, you know it will *always* be present to run your Java applications, applets, and development tools.
- Because you know that MRJ will be present, you do not have to expend substantial amounts of time and money implementing Java yourself and integrating it into your Java-savvy software. *As a result, MRJ will open Java development to all developers, not the select few who can now afford it.*
- By using MRJ, your application will deliver a consistent, high-quality Java experience to users. It will run faster and be more stable than any Java run-time engine that you might buy or implement yourself. And if you've adopted OpenDoc, your software gets Java support for free through the Apple Applet Viewer.
- Finally, the fact that the core of MRJ is implemented as shared libraries brings additional benefits. This allows you to reduce your application's memory footprint, because you don't have to include a Java run-time engine inside your application. Also, multiple applications can use MRJ at the same time. (This leaves users more available memory if they have multiple MRJ-based Java-savvy applications open simultaneously.)



MRJ (which includes the shaded blocks in this figure) lives between the Mac OS and different types of software that require it to run properly. (See the article text for the details of what each individual block does.)

Apple's Delivery of MRJ. As I said earlier, an beta version of Mac OS Runtime for Java is already available on the Web. A final-quality version, available by the end of the year, will add the invocation APIs; these will allow you to begin calling Java from your software. This means that, by the end of 1996, "Java as part of the Mac OS" will become a reality for both you and customers.

Apple plans to release future final-quality versions of Mac OS Runtime for Java every six to nine months, plus periodic development-quality releases between each final-quality release. Later versions of MRJ will include a just-in-time (JIT) compiler, more performance and human-interface improvements, and enhanced internationalization support. In addition, Apple will supply an MRJ release that is compatible with Java 1.1 as soon as possible after JavaSoft's release of the Java Development Kit (JDK) 1.1.

OpenDoc and Java Beans

Apple's integration of Java into the Mac OS doesn't stop with Mac OS Runtime for Java. Part of the Apple-Sun alliance includes both companies' participation in ensuring that Apple's OpenDoc and JavaSoft's Java Beans work well with each other.

So what does this *really* mean? It means that two component software architectures—which turn out to complement each other—will join to create a combined component-software solution that allows the creation of open (that is, not controlled by one company), cross-platform components.

What Is Java Beans? Java Beans is one of several extensions to the Java platform defined by JavaSoft. Java Beans is JavaSoft's API for creating component software written in Java and usable from Java software. (For better or for worse, when you use this technology to create a component, it is called a *Java bean* or just a *bean.*)

It turns out that OpenDoc and Java Beans complement each other quite nicely. Java Beans was designed to make it very easy for Java developers to create small, fine-granularity components that will run anywhere Java is present. In particular, the Java Beans technology is best for creating platform-independent user interface elements (buttons and radio boxes, for example).

OpenDoc, on the other hand, is a richer, more powerful component software architecture that is strongest for creating more complex components and component-based solutions. It can perform numerous functions that Java Beans wasn't designed to handle—for example, persistence (having a component remember its state after being closed and opened again), drafts (multiple "snapshots" of the document across time), and overlapping, non-rectangular objects.

However, OpenDoc's greater functionality requires a price to be paid if an OpenDoc part is to be ported to another platform. Unlike a Java bean, which runs "as is" on any platform that supports Java, you must rewrite your part's platform-specific code and recompile it to move it to another platform. (One way you can greatly minimize the amount of work needed to go cross-platform is by using the OpenDoc Development Framework to create your part.)

What the Apple-Sun Alliance Promises. The essence of the OpenDoc/Java Beans part of the Apple-Sun alliance is that Java Beans components will work inside OpenDoc containers and that OpenDoc parts will work inside any Java Beans component that is able to contain other components. This means that you will be able to use the best of both worlds—Java Beans to create "small" components quickly, and OpenDoc to use those components to create complex, component-based solutions for the desktop and Internet/intranet arenas.

Conclusions

Will Java succeed? Certainly, a lot of companies (not the least of which are Apple and Sun/JavaSoft) see the promise of Java and are strongly motivated to make sure that it does.

Apple is pursuing three long-term goals to ensure that Java succeeds, that Apple becomes a major force in the Java industry, and that people using Java automatically think of Apple as the best company to meet their Java needs.

First, Apple intends to provide the best Java experience to users and the best environment (through Mac OS–compatible computers) for developers to create Java products.

Second, Apple intends to be a major contributor to the evolution of Java.

Third, Apple intends to integrate Java into Apple system technologies.

Apple is well on its way to integrating Java into the Mac OS with the first release of Mac OS Runtime for Java by the end of the year—but that's not all Apple is doing. Expect to see more Java coverage in *Apple Directions* in the future. ♣

APPLE NEWS

Apple Posts Profit

continued from page 1

restructuring adjustment declined to $505 million from $519 million in the June quarter.

"We continue to make progress in strengthening Apple's financial condition, as our $410 million in positive cash flow from operations during the quarter suggests," said Apple Executive Vice President and Chief Financial Officer Fred D. Anderson. "We've reduced inventories by nearly $400 million since June and completed the quarter with over $1.7 billion in cash and short-term investments. Gross margins increased due to several factors, including declining component costs, improved manufacturing efficiencies, and sales of previously reserved inventory. We achieved further sequential reductions in operating expenses, primarily in general and administrative functions."

"By increasing revenues sequentially and fortifying Apple's financial position in each of the last two quarters, we have achieved two very critical goals of Apple's transformation," said Apple Chairman and Chief Executive Officer Dr. Gilbert F. Amelio. "We remain confident about reaching sustainable profitability by the end of Q2 '97. As we move forward, our challenges will be to extend our competitive leadership in key markets and to reclaim the mantle of industry pioneer and innovator."

"The question before us is not 'will Apple survive?'," said Dr. Amelio, "but rather, 'how will Apple establish leadership in the emerging digital era of the Internet and multimedia?' We plan to do so with strong management, a relentless dedication to quality, and a passionate commitment to our role as industry innovator."

For the company's fiscal year ending September 27, 1996, revenues were $9.833 billion, an 11 percent decrease from the prior year. The net loss for the year was $816 million, or a loss of $6.59 per share, compared with net income of $424 million or $3.45 per share in fiscal year 1995. The largest contributors to the fiscal 1996 loss during the year were after-tax inventory write-downs of $388 million in the second quarter, net restructuring charges of $113 million during the year, and after-tax warranty and related expenses that were approximately $126 million greater than historical rates would suggest.

For the year, international revenues accounted for 52 percent of Apple's net sales, compared to 48 percent in fiscal 1995.

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Free Company/Product Listing in SPA Web Databases

The Software Publishers Association is currently working on a new version of its online Industry Directory (which lists companies, their business focus, and company contacts) and on a new Product Locator database (which allows users to find software based on any combination of product name, company name, and software category).

Whether or not you are an SPA member, you are invited to enter a company/product listing for yourself so that anyone who accesses either SPA database can find out about you. SPA members, however, get extra features when their product or company is included in the results of a search—for example, member entries are listed at the top of the search results, and they include a link to the member's Web site.

To place your information in the SPA databases, go to **http://www.spa.org/member/dir.htm** on the Web.

Then go to the bottom of the page and follow the instructions for SPA members or nonmembers. (Note: If you are a non-SPA member, the submission form you fill out will be several screens long. When you click the button at the bottom of the first page, you will automatically go to the next page of the form.)

■ ■ ■

Apple Launches Aggressive Campaign to Promote Third-Party Software

Apple Computer, Inc. has recently launched an aggressive communications campaign for promoting third-party software titles for the Mac OS. Named "All great software wears this face," the campaign is designed to raise the visibility of third-party software for the Mac OS by making it easier for customers to identify, locate, and purchase Mac OS software products through various distribution channels.

The campaign is primarily designed to address issues surrounding what are called "hybrid" CDs, which contain multiple-platform versions of the software in a single package. Hybrids account for a large percentage of overall Mac OS software titles but may not be sold in a software retailer's Mac OS section, potentially creating the perception that there are fewer software titles for the Mac OS.

In-store merchandising will include attention-getting banners, posters, and floor decals. Displays in selected retailers' Mac OS sections will identify the hottest new software to hit the market for Macintosh computers. Brightly colored pamphlets will offer customers peel-off notes explaining the hybrid issue and how to identify all software that runs on the Mac OS. More important, additional signs, shelf cards, and labels will help shoppers pinpoint Mac OS software titles outside the Mac OS section. All collateral will sport the Mac OS logo and tag line "All great software wears this face."

The campaign will be reinforced by target-

ed advertising in major publications. Like the merchandising, the advertisements will feature popular Mac OS software titles, providing third-party developers with high-level exposure to large audiences. This is particularly valuable to smaller developers with modest advertising budgets. The advertising will reinforce the entire campaign by providing a special toll-free telephone number and comprehensive Mac OS software site on the World Wide Web.

The toll-free telephone number will provide customers with easier access to information on Mac OS software products. By dialing 800-500-4862, customers will be given several options. The first will provide the names of Mac OS software retail stores in a caller's geographic area. The second will provide information about ordering software directly from one of several popular Mac OS mail-order catalogs. The third option will give customers the opportunity to receive a fax listing of hot new Mac OS software, as well as information on how and where to shop for other Mac OS products.

The final option will provide information about Apple's special Mac OS software Web site (**http://www.macsoftware.apple.com**), which will feature over 12,000 third-party Macintosh products brought together in one convenient online location. This Web site will also contain information on purchasing specialized Mac OS software that cannot be obtained through standard sales channels.

This campaign is initially being launched in the United States and Canada. In the future, certain parts of the campaign are expected to be launched in other countries based on local market requirements.

■ ■ ■

PowerBook 1400 Series Offers Expansion Bay for CD Drive and More

The PowerPC processor–based PowerBook 1400 series of Macintosh notebook computers begins revitalization of the PowerBook line with new features that include an expansion bay; built-in infrared technology for easy, wireless file sharing with similarly equipped systems; removable, clear exterior panels (for customizing the PowerBook's appearance); and bundled software (including ClarisWorks and the Apple Internet Connection Kit). The expansion bay will accommodate various types of storage, including a floppy drive, CD-ROM drive, additional hard drive, magneto-optical drive, or Zip drive.

The Apple PowerBook 1400 will be available in four different configurations. Three of the systems use a 117-MHz PowerPC 603e processor. One of the systems uses a higher-performance version of the chip running at 133 MHz with a Level 2 cache. Depending on the configuration, the PowerBook 1400 series features 11.3-inch dual-scan or active-matrix displays, two PC card slots, 12 or 16 MB of RAM (expandable to 64 MB), 750 MB or 1 GB hard drives, and a floppy and/or 6X-speed CD-ROM drive. U.S. estimated selling prices for the four configurations range from $2,500 to $4,000. The 117-MHz configurations of the PowerBook 1400 are expected to be available beginning in mid-November. Availability of the 133-MHz version is expected in January.

In related news, in the first half of 1997 Apple plans to introduce another new series of PowerBook computers—a higher-performance line designed to appeal to mobile Macintosh users with advanced multimedia and communications needs in publishing, design, and enterprise settings.

For more details on the PowerBook 1400 series, see the press release at **http://product.info.apple.com/pr/press.releases/1997/q1/961021.pr.rel.pb1400.html** on the Web.

■ ■ ■

List Your Products in the Mac OS Software and Hardware Guide

Apple Developer Relations is working hard to increase the visibility of Mac OS products in the market. The Mac OS Software and Hardware Guide, a searchable Web-based directory of Mac OS products, is part of Apple Computer's current initiative to promote third-party Mac OS software.

Apple wants you to make sure that all your products are registered in the Mac OS Software and Hardware Guide, as Apple is working to have this Guide become the definitive product guide for Mac OS products. There is no cost for registering your products. Apple Developer Relations has plans to create CD versions of this guide, as well as print versions for various marketing collateral pieces for Apple field representatives, channel partners, and customers.

You can check out the new guide at **http://www.macsoftware.apple.com**, and you can register your products through the Developer World site at **http://devworld.apple.com/mkt/submission.html**. Be sure that you complete the entire submission form, as this information will be used by several Apple marketing groups. All submissions will stay in the database for a period of one year from the date displayed in the "Last updated" column. Entries older than one year will be deleted, so you may want to have a representative monitor your product entries on a quarterly basis.

■ ■ ■

Apple Adds Two New Members to Performa Family, Cuts Prices of Entire Line

Only days after Apple's report of a $25 million profit for the quarter ending in September (see the news story on page 1), Apple stunned the market by announcing aggressive new pricing for its Performa line of Macintosh computers, introducing two new models, and reducing the price of some models by as much as $600. These changes allow customers to buy Performa computers at a lower price than comparable Pentium-based PC clones.

The first new computer, the Macintosh Performa 6400 Video Editing Edition, contains built-in hardware and bundled software (Avid Cinema) that allow customers to digitally record and edit video "out of the box." (This is an improvement over PC clones, which force the user to choose and install both video hardware and software to get the same capabilities.)

Powering the Macintosh Performa 6400 Video Editing Edition is a 200-MHz Macintosh Performa 6400 with 32 MB of RAM and a 2.4 GB hard drive. The system also comes with Apple's video system, 1 MB of video RAM, 256 KB of Level 2 cache (special memory that increases performance about 30 percent), an 8X-speed CD-ROM drive, and a 28.8 KB

Price/Performance Comparison

Brand/model	Configuration*	Price**
Entry-level computers		
Packard-Bell C110	120 MHz/16 MB RAM/1 GB HD	$1,243
Packard-Bell D130	133 MHz/16 MB/1 GB	$1,432
Compaq Presario 4112	120 MHz/16 MB/1.6 GB	$1,484
Compaq Presario 4704	133 MHz/16 MB/1.6 GB	$1,699
HP Pavilion 7055	120 MHz/16 MB/1.6 GB	$1,699
Macintosh Performa 6360	**160 MHz/16 MB/1.2 GB**	**$1,499**
Mid-range computers		
Compaq Presario 4122	150 MHz/16 MB/2.5 GB	$1,866
Packard-Bell F170	166 MHz/16 MB/2 GB	$1,871
HP Pavilion 7270	166 MHz/16 MB/2.5 GB	$2,199
Compaq Presario 4712	166 MHz/24 MB/2.5 GB	$2,211
Macintosh Performa 6400/180	**180 MHz/16 MB/1.6 GB**	**$1,899**
High-end computers		
Packard-Bell Platinum 70	200 MHz/24 MB/2 GB	$2,399
Compaq Presario 4716	200 MHz/32 MB/2.5 GB	$2,787
HP Pavilion 7285	200 MHz/32 MB/3.1 GB	$2,949
Macintosh Performa 6400/200	**200 MHz/16 MB/2.4 GB**	**$2,199**
Macintosh Performa 6400/200 Video Editing Edition	**200 MHz/32 MB/2.4 GB**	**$2,699**

*Pentium and PowerPC 603e processors. Computers selected for comparison are all mainstream models with 16 MB of RAM minimum. This chart does not attempt to equalize configurations, so the PCs do not have SCSI, ADB, and several other features built into the Performa line.

**U.S. pricing. Competitive street prices according to *IDC PC Pricing Report,* 9/96. Apple prices are estimates and may vary from dealer to dealer.

data/ fax/voice modem standard. The U.S. suggested Apple price for this computer is $2,699. Two other configurations of the Performa 6400 (without video-editing capabilities) are available at U.S. suggested Apple prices of $1,899 and $2,199.

For the first-time buyer or family user, the new Macintosh Performa 6360 is an impressive computer at an impressive price. The Performa 6360 uses a 603e 160-MHz processor, comes with 16 MB of RAM, provides a 1.2 GB hard drive, and includes an 8X-speed CD-ROM drive—all at a U.S. suggested Apple price of $1,499 (monitor not included). All the prices quoted here are for the U.S. market only. Pricing and availability will vary outside the United States.)

The chart above shows how these new Macintosh Performa computers beat the Wintel competition. For more details on the Performa computers, see the press release at **http://product.info.apple.com/pr/press.releases/1997/q1/961017.pr.rel.performa.html**. You may also want to visit the new Performa Web site at **http://performa.apple.com/**.

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MessagePad 2000—Apple's Next-Generation Newton-Based Information Appliance

On October 28, 1996, Apple unveiled the Apple MessagePad 2000, one of the first products from Apple's newly formed Information Appliance Division. The MessagePad 2000 is a complete mobile computer for the business professional. It includes a built-in e-mail program and Web browser, as well as a screen that can display text, GIF-formatted graphics from HTML pages, and a full-page fax. It also includes a new version of the Newton Operating System, version 2.1, which is compatible with most Newton OS 2.0 software.

Beyond Internet access, the MessagePad 2000 includes a built-in spreadsheet (available in most configurations); a word processor; a personal information manager with calendar, phone list, and reminders; connection software and hardware for linking to both Windows and Macintosh desktops; and the built-in recording capability to take voice notes or record a meeting—up to an hour on one 4 MB PC Card.

Among the hardware features of the MessagePad 2000 are a backlit, 16-level grayscale display that allows users to view, among other things, Web pages with GIF graphics; 5 MB of memory; and 8 MB of ROM. It uses a 160-MHz StrongARM processor, which was jointly developed by Digital Equipment Corporation and Advanced RISC Machines. The StrongARM processor is significantly faster than the ARM processors used in previous MessagePad models and is one of the most power-efficient processors on the market: The MessagePad 2000 can run for three to six weeks on four AA batteries or a nickel-metal-hydride (NiMh) battery pack.

Retail prices for the MessagePad 2000 are expected to begin at less than U.S. $1000, depending on configuration and reseller. The product is expected to be available in the United States in the first quarter of calendar year 1997.

For more information, see the following press release at **http://product.info.apple.com/pr/press.releases/1997/q1/961028.pr.rel.msgpd2000.html** on the Web.

■ ■ ■

HotSauce Brings Structured Content to the Internet, Desktop, and Networks

At the Interop Dotcom trade show, Apple Computer announced growing industry support for its proposed open industry standard, HotSauce metacontent format (MCF), which allows developers to build data access tools that work with any kind of Internet or intranet-based data. (HotSauce MCF and HotSauce were formerly known by the code names *MCF* and *Project X,* respectively.) Key industry endorsers include Netscape Communications, XSoft (a division of Xerox), Excite, BigBook, and EveryWare Development. Apple had previously announced that CNET and Yahoo have implementation plans for HotSauce MCF.

Apple also announced that users had downloaded over 75,000 copies of its HotSauce fly-through plug-in for Macintosh and Windows 95/NT platforms from the HotSauce Web site. Over 100 Web sites have been mapped using HotSauce MCF to date, including such diverse Internet locations as *PC Week* Australia, Metrowerks (a leading development tools provider), *MacUser* magazine, and the town of Marblehead, Massachusetts, in addition to Yahoo, CNET, and others. Finally, several software developers have already developed HotSauce MCF tools and applications.

HotSauce MCF is an open standard for describing structured content, not just on Web sites but also on your own computer and local area networks. A HotSauce fly-through plug-in, compatible with Netscape Navigator™ and Navigator plug-in-compatible Web browsers, allows users to view MCF-tagged Web sites using a 3D interface.

For more information on HotSauce and HotSauce MCF, read the press release located at **http://product.info.apple.com/pr/press.releases/1996/q4/960918.pr.rel.internet.html**. You can download the HotSauce fly-through plug-in from the Web at **http://hotsauce.apple.com**.

■ ■ ■

Apple Open Transport 1.1.1 Enhances Mac OS Networking Performance and Reliability

On October 25, 1996, Apple announced the availability of Apple Open Transport 1.1.1, an enhanced version of Apple's standards-based networking and communications system for Macintosh and Mac OS–compatible computers.

Open Transport 1.1.1 is an update for Mac OS–based systems currently running Open Transport 1.1 and is a recommended upgrade for all Open Transport users. In addition to bug fixes that increase overall compatibility, performance, and stability, the update provides significant performance enhancements for Mac OS–based Internet and intranet servers and includes support for the new Open Transport/PPP implementation.

Open Transport 1.1.1 supports Mac OS computers that previously could not use Open Transport. Open Transport 1.0 began shipping in 1995 as a standard feature of Apple's new PCI-based Power Macintosh systems; Open Transport 1.1 added support for most 68030, 68040, and additional PowerPC processor–based systems and was included in System 7.5.3. Version 1.1.1 adds support for the PowerPC processor–based Mac OS systems that were not supported by version 1.1.

Open Transport 1.1.1 includes a series of enhancements to its TCP/IP implementation that improves the performance and reliability of Mac OS–based Internet and intranet servers.

Version 1.1.1 also includes support for Open Transport/PPP, which is currently undergoing a public beta seed on the Internet and will be released later this year. OT/PPP is the first PPP implementation for the Mac OS to take full advantage of the standards-based Open Transport STREAMS architecture. By utilizing STREAMS, Open Transport/PPP offers an extensible foundation for enhancements and is prepared for the transition to a modern OS foundation. Open Transport/PPP is also the first PPP implementation to offer the performance and stability of native code on PowerPC processor–based Mac OS systems.

Open Transport is required on Mac OS–based computers that include a PCI bus, and is optional on 68030, 68040, and PowerPC processor–based systems that do not use the PCI bus.

For users who have access to the Internet, America Online or CompuServe, the Open Transport 1.1.1 upgrade is available at no charge beyond any connect charges. You can download Open Transport 1.1.1 from the Web at **http://devworld.apple.com/dev/opentransport/Download/OT1.1.1.sea.hqx**.

You can also find Open Transport 1.1.1 on Apple sites within America Online (keyword: *applecomputer*) and CompuServe (shortcut: *GO APLSUP*). Customers in the United States can order the Open Transport 1.1.1 Update on CD for U.S. $13 by calling 800-293-6617; refer to offer number 1407. This fulfillment program is scheduled to run through January 31, 1997.

Open Transport 1.1.1 is an update for Mac OS–based systems currently running Open Transport 1.1. Customers of all previous System 7.5–family releases can update free of charge to System 7.5.3 and Open Transport 1.1 using System 7.5, Update 2.0, which is also available in Apple's Software Updates Archives. Open Transport 1.1 is also available as a retail package, Apple part number M4252Z/A, which allows installation on System 7.1, 7.1.1, and 7.1.2.

For more information, see the press release on the Web at **http://product.info.apple.com/pr/product.updates/1997/q1/961025.prd.updt.opentrans.html**.

■ ■ ■

Apple Updates Mac OS to System 7.5.5, Explains Numbering Strategy for New System Releases

Apple recently released System 7.5.5 Update, a set of system software enhancements that significantly improves the overall reliability and performance of all Mac OS–compatible systems. It provides one update for all computer systems currently running System 7.5.3 and integrates all improvements found in the System 7.5.3 Revision 2 update, released last June.

System 7.5.5 includes numerous performance, reliability, and network improvements.

It is also the final system software release for the Macintosh Plus, SE, Classic, Portable, SE FDHD, SE/30, LC, II, IIx, and IIcx, and the PowerBook 100. Future Mac OS releases will require 68030-based, 68040-based, or PowerPC processor–based systems that support 32-bit memory addressing (which includes all Macintosh models except the ones listed above).

In response to customer feedback, Apple has standardized how version numbers will change for future system software releases. If major architectural changes are being delivered, the first digit of the version number will be incremented. If new features are added to a system software reference release without major architectural changes, the second digit will be incremented. When system software updates are delivered with only reliability and performance improvements, the third digit will be incremented. (Note that System 7.5.4 Update was not made available to the general public due to a problem with the software.)

For more details on System 7.5.5 Update and the improvements it delivers, see the press release on the Web at **http://product.info.apple.com/pr/product.updates/1996/q4/960919.prd.up.sys7.5.5.html**.

■ ■ ■

Apple Announces World's First Integrated Chinese Input Solution

Reinforcing its commitment to deliver computing solutions in many languages, Apple just announced the first integrated solution for entering Chinese text as input on Mac OS-based computers. The Apple Advanced Chinese Input Suite (ACIS) represents a major milestone in Apple's effort to bring innovative and easy-to-use solutions to Chinese-language computer users. The suite includes Apple's first Chinese handwriting solution, enabling customers to switch effortlessly between a microphone, graphic tablet, and keyboard to enter simplified and traditional Chinese characters.

ACIS consists of three components: the Apple Chinese Dictation Kit 1.5, the Apple Chinese Handwriting Kit 1.0, and Apple Chinese Text-to-Speech 1.0.2. All the ACIS components can be easily installed from a single CD-ROM. ACIS is easy to learn because customers can access instructional QuickTime movies and an online manual from the installation CD. This suite also comes with the Apple Dictation Microphone. The Apple Dictation Microphone is a unidirectional microphone that reduces surrounding noise when dictating with the Chinese Dictation Kit 1.5, ensuring accuracy of word recognition.

For more details, see the complete press release at **http://product.info.apple.com/pr/press.releases/1997/q1/961009.pr.rel.chinese.html** on the Web.

Last September, an earlier version of the Chinese Dictation Kit won the Singapore 1996 National Technology Award; for more details, see the press release on the Web at **http://product.info.apple.com/pr/press.releases/1996/q4/960905.pr.rel.award.html**.

■ ■ ■

Apple eMate 300 Brings Newton-Based Mobile Computer to Education Market

On October 28, 1996, the Information Appliance Division of Apple Computer unveiled Apple eMate 300, a low-cost (under U.S. $800), Newton-based portable computer that students can use as a mobile solution to most of their classroom computing needs.

Here are the major features of the eMate 300:

- weight—under 4 pounds
- physical design—"clamshell" form factor, measuring 12 by 11.4 inches
- input methods—stylus (for drawing on the screen) and full-size keyboard
- built-in software—Newton Works, which includes a styled-text word processor, drawing program, spreadsheet, and graphing calculator; it also includes an address book, a notepad, a calendar, and classroom management software (which allows one eMate 300 to be shared by multiple users)
- hardware—ARM 710 32-bit RISC processor, 8 MB of ROM, and 3 MB of memory (1 MB DRAM, 2 MB flash RAM); 480-by-320 backlit, 16-level grayscale LCD display, capable of showing the width of a full printed page; one PC Card slot that can accommodate a Type I, II, or III PC Card
- output—can connect to Mac OS computers and PCs, can print to a variety of printers, and can communicate to other eMate 300 computers through an infrared sensor
- Internet capabilities—the bundled Newton Internet Enabler makes it possible for the eMate 300, with optional modem, Internet service, and Web and e-mail software, to access the Internet

Individual eMate 300 systems will be available to education customers only for an anticipated price of less than U.S. $800. The eMate 300 can also be purchased in eight-packs. Available in an English version only, the eMate 300 is expected to ship in the United States during the first quarter of calendar year 1997.

For more information, see the press release on the Web at **http://product.info.apple.com/pr/press.releases/1997/q1/961028.pr.rel.emate.html**.

■ ■ ■

Top Web Designers Prefer the Mac OS Platform

The October 7, 1996 issue of *Web Week* reports that 64 percent of 39 top Web site design firms use Mac OS computers for creating Web content. (23 percent use UNIX® systems, 17.5 use PCs running Windows 95, and 5 percent use PCs running Windows NT.) In addition, 61 percent of the surveyed firms use QuickTime for displaying video on the Internet, compared with 13 percent that use AVI.

To read the complete article, which also presents data on favorite HTML authoring tools and interactivity standards, see the Web site located at **http://www.webweek.com/96Oct07/undercon/designsurvey.html**. ♣

Technology

develop Issue 28: Read It and Thrive

Issue 28 of *develop,* Apple's award-winning technical journal, will quench your thirst for information (and code) in the areas of scripting, QuickDraw 3D, QuickDraw GX, OpenDoc, and more. Here's a taste of the articles in this issue:

- "Coding Your Object Model for Advanced Scriptability" goes beyond basic support for an Apple event object model to supporting more complex scripts, which can trip you up in subtle ways if you're not careful.
- "New QuickDraw 3D Geometries" introduces the new geometric primitives in QuickDraw 3D version 1.5 and discusses the differences among the various polyhedral primitives, both new and old.
- "QuickDraw GX Line Layout: Bending the Rules" describes a library that makes it easy to draw text in QuickDraw GX along an arbitrary path.
- "MacApp Debugging Aids" discusses techniques for uncovering problems like memory leaks and access faults in MacApp programs, along with some ways of managing memory usage.
- "Chiropractic for Your Misaligned Data" will help you detect—and avoid—the potentially expensive problem of misaligned data accesses on PowerPC processors.

If that doesn't satisfy you, you'll also find columns on these topics: OpenDoc memory management and its interactions with the Toolbox; simple source code control; a powerful text-editing tool in MPW; and complications to avoid in your printing code. On the lighter side (but still providing useful tips) are the ever-popular Veteran Neophyte column

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CD HIGHLIGHTS

November and December Developer CDs

Changes are in store for the Developer CD Series, starting with me: I've been producing these discs since the July 1993 edition, and it's time for a small step up (and maybe a bit sideways). I have recently been offered a long-sought opportunity to devote myself to writing code full-time for Web tools, FTP tools, and applications like Apple HTML Local Search. I'll be leaving you in the capable hands of Meredith Best (mbest@apple.com), who has been doing much of the preproduction of the CD for the past several months.

Many thanks to all of you who have shared your comments and ideas, both by e-mail and at past WWDCs and EDFs. I'll miss working directly with developers; hopefully some of you will see fit to continue to yell at me about Local Search, SWAt, and whatever else I can convince my boss to let me do.

This month I'll give highlights of both CDs included in the developer mailing.

Tool Chest Edition, November 1996

Beginning with this CD, the Programs & Marketing folder (including the electronic version of *Apple Directions,* Market & Distribution Guides, and more) will appear on the Tool Chest edition of the Developer CD, to make more room for our ever-expanding technical documentation on the Reference Library edition. Also, we have room on this CD for some new versions of Macintosh System 7.5.3 (including Kanji) and the new System 7.5.5 Update.

In addition to updates to the Apple Game Sprockets, the "Game Controls for QuickDraw 3D" article from *develop* Issue 27, and MoreFiles, here are the November CD's new and revised packages.

AE Suite • Mail 1.0

The Mail Suite provides the framework and some tools for creating an Apple event suite for mail within applications. This package contains Mail Suite documentation, a sample dictionary ('ATET' resource), a demo script, a .h header file, and a dummy application (MailFoo).

Apple Color OneScanner SDK

This folder contains documentation for the scanner API (application programming interface), an addendum for the new 4.1 scanner driver, and C sample code that demonstrates how to use the API. A header file and link library have been included with the sample code.

The sample code should not be considered as a model for the next great scanner application but rather as a simple demonstration of how to communicate with a scanner. Please take special considerations when considering memory requirements for your imaging model. Because images scanned at high resolutions can be extremely large, you may want to consider spooling the data to disk as it comes in from the scanner. This method will reduce the overall footprint of your application and allow for high-resolution scans without allocating huge quantities of memory.

Apple International Glossaries

The Apple International Glossaries package allows you to save time and money in the localization process by automatically translating all resources that contain standard Mac OS terminology. Your localized products will be more consistent with the translated Mac OS. This package contains translations for 1,337 Mac OS terms in 34 languages.

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FEATURE

OpenDoc Human Interface FAQs

Stationery, Controllers, the Quit Command, and More

By Kerry Ortega, Elizabeth Dykstra-Erickson, Geoff Schuller, and Katie Candland, Apple OpenDoc Human Interface Team

The OpenDoc human interface team frequently receives questions about OpenDoc that we need to answer in a public forum to help our partners' OpenDoc development efforts. We think you should know about the topics these questions address.

Q. OpenDoc should provide something similar to the AppleScript dictionary. With the Script Editor I can learn about the scripting capabilities of applications. With OpenDoc there is no way of finding out about the semantic interface of OpenDoc editors without getting my C compiler out of the cupboard. This facility is very important for system integrators, in-house developers, and consultants.

A. Due to limitations of the Script Editor, you cannot open the dictionary for OpenDoc documents by using the Open Dictionary menu item. You need to drag the document icon for an open document onto the icon for the Script Editor (or an alias to it). This will open the dictionary window for OpenDoc.

Make sure the document is already open; dragging a closed document onto the Script Editor will hopelessly confuse it, requiring that you close and restart the Script Editor or, in some cases, that you restart your computer.

We hope to get this problem fixed in a future release of AppleScript. Note that this problem is not present in some of the third-party script editors, but we haven't checked them all. We know that Script Debugger copes well with OpenDoc documents, though.

Q. How do users know, without first trying, whether a document or part is a leaf part or a container into which they can drop things?

A. There isn't any visual feedback for this, so users just have to try it. As more parts become available, we will be able to test whether there needs to be a visual distinction between leaf and container parts.

Q. Creating stationery should be much easier. Perhaps you could put an item in the File menu of the Finder?

A. We tell all developers that they should ship stationery with their editors. This is part of the Live Objects Human Interface checklist. There are currently two ways for users to create stationery: by setting the checkbox through the Get Info command, or in the Document Info dialog box of an OpenDoc document. This lets users make stationery without adding to our menu structures; since there are already two ways to create stationery, we don't feel it's necessary to add a menu command. There is an additional problem in having a menu command for creating stationery: It makes the assumption that there's a one-to-one correspondence between stationery and an editor. Developers and resellers create solutions out of several editors and provide one piece of stationery. For example, if you were providing a suite of parts, you might have a single page-layout part at the root with text, draw, and spreadsheet parts embedded in the page-layout part. Thus, each part of the suite is made up of two editors—Page Layout and Text, Page Layout and Draw, and Page Layout and Spreadsheet—not just a single editor.

Q. There needs to be a quick way to access stationery. Having to switch to the Finder to add functionality to a document is bothersome, especially on smaller screens.

A. Some of the proposed Finder capabilities do fix this. For example, pop-up folders provide a quick way to access your stationery folder without cluttering every document window with a task bar. We've also requested that an OpenDoc Stationery item be added to the Apple Menu Items folder. We will be watching this issue closely in our user studies to see how big a problem it might be.

Q. Here's a problem: Imagine that you're working in a draw document and that you have several embedded pictures in it. You crop one of them to be "smaller," thus making its "used shape" smaller than its frame shape. The user attempts to drag-select ("marquee-select") this object, drags around the visible region (the used shape), and releases the mouse button. No selection occurs.

A. Yes, we've seen this frustrate users in some of our user studies. It's really a problem with the container part editor. During drag selection, the part editor needs to acknowledge the used shape so that in the example you describe, the user can drag-select the part by dragging around its used shape.

Q. I have a controller for my part (like the movie controller for QuickTime). I'm using a palette for it, but I disagree with the advice you gave about the default position of the upper left. I think it should be near the part.

A. Yes, we agree! The default position for tool palettes (for example, drawing tools) is in the upper left, but for controllers it makes sense for you to place them near the part.

Q. I'm working on a drawing part. One of the functions of the part is to zoom the image. When users zoom an image, what should my part do with embedded parts? Should I leave the parts only and just zoom my content? How about if the part is represented by an icon?

A. Your part editor should "zoom" all the content, including embedded parts. It should also "zoom" any icons. This keeps the layout of your part the same. In addition, your part editor should also display the active border and selection handles with the same "zoomed" relationship. One exception to this is the drag-and-drop feedback. In today's applications, drag-and-drop feedback is 2 pixels wide, regardless of the size of the target. This is because the Drag Manager handles the drawing of these borders in most cases. If your part editor draws the drag feedback, you should also make your feedback 2 pixels wide so that your part is consistent with what the Drag Manager does.

Q. It should be possible to package a work session and manage it as a unit. Why isn't there a Close All command?

A. We thought about adding a Close All com-

mand to the Document menu, but we decided that the menu was already getting too long. So, here's what we did instead:

• We support Option-click for the close box, or Command-Option-W to close all windows of this document. This means that if the user has a document open in one window, only that window closes. If the user has opened an embedded part into a separate window (for example, through the View In Window command), those windows will also be closed.

• When your part is the root part, and therefore manages the Document menu, you may add a Close All command if you feel you need to do so. We don't think users will need a Close All command in today's typical usage, so we discourage doing this—but there may be situations that we don't know about. Part editors that spawn a lot of windows may need this command. If you add the command, place it after the Close command. Don't use Command-Q for Close All; to the user, that shortcut may represent quitting a process rather than closing a window.

Q. In my part editor, I have a few settings—for example, Scale to Fit Frame. Your guidelines say to place settings in Part Info (accessed through a Settings button). I don't really like the idea that these settings would be accessed through the Part Info dialog box, since it takes a bit of work for users to find it and they might not even know it's there.

A. Point well taken. What we have established is a predictable place to find settings for parts. You can, however, place these settings in your menus for faster access. You just need to make sure that the menu and the dialog box remain in sync.

Q. After years of preaching the Document menu and the removal of the Quit command, Apple appears to have flip-flopped on the issue. What gives? Why did they change this? I think the lack of a Quit command goes a long way toward simplifying the user interface. How many times have you sat down at a new user's machine and found ten applications running in the background with all their windows closed?

A. Our guidelines still say that there is no Quit command in OpenDoc. Of course, this is a guideline and there isn't any way for us to enforce what we consider to be good design. However, we have *not* in any way abandoned the concept of removing Quit. In fact, our user studies have shown that most people do not care that the Quit command is gone. However, individual developers using OpenDoc for container applications (which are, after all, applications) may elect to use a Quit command. But for OpenDoc parts, there should be none. ♣

CD HIGHLIGHTS

Developer CDs

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The glossaries are provided in three different formats. To look up a specific term easily, use the ClarisWorks spreadsheet format of the glossaries (in the folder Apple Glossaries [SS]). To import the glossaries into other spreadsheets or databases, use the tab-delimited text files. To automatically pretranslate your product, use the AppleGlot Language Glossaries (LG) files.

Note: In addition to using these glossaries for your localization efforts, be sure to have your translations tested for accuracy, as mere word substitution sometimes will not satisfy grammatical requirements.

Chinese Dictation Kit 1.5f2

For years, Chinese text input has been a bottleneck for computer users. Although hundreds of different keyboard input methods have been developed, they have invariably been either difficult to learn or slow to use. For most users, the fastest and most natural way to input Chinese text is through dictation. However, until now, large vocabulary dictation software typically required expensive high-end workstations and hardware add-ons.

The Apple Chinese Dictation Kit (CDK) uses a sophisticated training process to recognize your voice and even your accent. In contrast to most other Chinese dictation software, CDK allows you to speak a phrase at a time, instead of a character at a time, which enables the system to handle about 40–60 characters per minute.

Users can dictate over 350,000 phrases and can customize the CDK's vocabulary by adding phrases. The CDK can adapt to a user's word patterns to improve long-term performance, and can scan a user's text files to add words to the system. The product features voice commands for frequently used functions, as well as a voice macro feature, which lets users input long addresses or aphorisms by speaking a single word.

Note that this is the f2 release of the CDK, not a final version. Please read the release notes and Read Me files carefully.

Chinese Handwriting Kit 1.0f1

The Apple Chinese Handwriting Kit offers another simple yet powerful way of entering Chinese characters into a Macintosh computer. Users write Chinese characters or phrases with the bundled wireless stylus and graphics tablet, and this input is automatically segmented and converted into 2-byte digital text that can be further formatted in any word-processing or page-layout program.

The Chinese Handwriting Kit is a true plug-and-play solution. It recognizes virtually all 3,000 simplified characters—or more than 7,000 traditional characters—found in common usage, without the need to pretrain the system. It accurately converts characters written in cursive or print form with no interpretation delay. Other features include

• support for both PowerPC processor–based and 680x0-based Macintosh computers, and compatibility with virtually any application that allows text input

• a user-expandable dictionary that enables phrases to be represented by simple clicks, and a separate lexicon manager for maintaining dictionaries

• accommodation of different writing styles

• on-screen keyboards for quick input of symbols and punctuation marks

• a unique Stroke Player that shows the correct way to write Chinese characters

Note that this is the f1 release of the kit, not a final version. Please read the release notes and Read Me files carefully.

Developer Notes Update

This folder contains descriptions of new hardware and software features, comparisons with existing CPUs, and information on expansion card design. The November CD's edition features the following two new notes.

• The Macintosh Performa 6400 computer is a new Macintosh model that incorporates a PowerPC 603e microprocessor running at 160, 180, and 200 MHz, a second-level cache expansion slot, two Peripheral Component Interconnect (PCI) card expansion slots, enhanced audio-video (AV) features, and a new PCI-based communications slot (Communications Slot II). The Performa 6400 is housed in a new tower enclosure, featuring easy access, an expansion bay, and a built-in subwoofer.

• The PowerBook 1400 computer is an all-in-one notebook computer based on the PowerBook 5300 computer but with improved capabilities and an all-new case design. The PowerBook 1400 has a PC card slot, an expansion bay, an internal expansion slot, an infrared link, and space for a rechargeable battery.

HotSauce

HotSauce (formerly known as *Project X*) is a technology demonstration based on HotSauce MCF (metacontent format), a format for representing information about content.

The goal of HotSauce MCF is to provide an adequate language for representing a wide range of information about content such as Web pages, gopher and FTP files, desktop files, e-mail, and structured databases. The corresponding metacontent includes indexes such as Yahoo, gopher and FTP directory structures, e-mail headers, data dictionaries, and so on.

HotSauce is just one of the applications enabled by HotSauce MCF. It should be possible for many different applications to use the metacontent represented in HotSauce MCF.

SimpleText Sample

This folder contains some SimpleText source code. It shows how to write SimpleText, and it implements calling the PPC library from 680x0 code, using Apple Guide, and other swell things.

Reference Library Edition, December 1996

In addition to updates to the Gestalt Selectors List, *Inside Macintosh,* and the Installer SDK, here are the December CD's new and revised packages.

Apple Guide 2.1 Update

This folder contains updates to the Apple Guide SDK. New features of Apple Guide 2.1 include the following:

• Apple Guide now supports help access from OpenDoc processes, which involves numerous OpenDoc parts, rather than a single application process as in the previous help environment. For information on providing guide files for OpenDoc parts, see the *develop* Issue 27 article "Using Apple Guide 2.1, OpenDoc."

• Apple Guide now allows access to multiple guide files combining the topic areas, index, and "look for" content across all open guide files.

• There is now CFM 680x0 glue code present for 680x0 applications that must link with the AppleGuideGlueLib.68K shared library code.

• Your application no longer has to build and handle the Help menu if you want guide files to reside in a folder other than the application's folder. By including a Guide Directory resource (type 'gdir'; ID –16384) in your application, you can specify a different directory for Apple Guide to search for guide files.

• Whether or not an application has guide files, previous versions of Apple Guide searched through the application's directory five different times for guide files. Apple Guide 2.1 performs a single search and is much faster. Any guide file information found is cached for performance.

ColorSync 2.1.1GM

ColorSync 2.1.1 is a second-generation color management system that offers prepress-quality color matching and separations. ColorSync 2.1.1 offers substantial benefits for developers. Now there's a standard architecture and profile format for color matching on the desktop that delivers the solution that users have asked for. You no longer have to make decisions about which application programming interface (API) and profile format to use, or waste time writing custom routines. The ColorSync 2.1.1 API provides the most powerful "plumbing" for color management.

develop Issue 28

This is the electronic version of *develop* journal. For highlights of articles in Issue 28, see "*develop* Issue 28: Read It and Thrive" on page 10.

Developer Notes Update

Developer notes contain descriptions of new hardware and software features, comparisons with existing CPUs, and information on expansion card design. The December CD features a new note describing the Macintosh PowerBook 1400.

The PowerBook 1400 computer is an all-in-one notebook computer with improved capabilities over its predecessor, the PowerBook 5300. The PowerBook 1400 has a PC card slot, an expansion bay, an internal expansion slot, an infrared link, a customizable case exterior, and space for a rechargeable battery.

Snippets Update

• *DeskPat.* This snippet shows how to access the "Set Desktop Pattern" and "Set Utilities Pattern" patterns in the Desktop Patterns control panel. (Users set the latter pattern by holding down the Option key in the control panel.) This control panel stores these patterns using resources of type 'ppat'. The 'ppat' resource is stored in the System file in your System Folder; the desktop pattern has an ID of 16 and the utilities pattern has an ID of 42. Note that since this information is not documented, it is subject to change at any moment.

• *PDlog Expand.* This example shows how to add items to print dialog boxes (with Balloon Help and subdialogs). This snippet is new and improved sample code to accompany Tech Note PR09.

• *ROMResourceDump 1.0d1.* This little utility copies all of the resources in the Macintosh's ROM into a file called *ROM Resource Dump File.* It's useful for the insanely curious, those with a professional "need to know" (like DTS engineers), and as a trivial Resource Manager sample.

Toolbox Assistant

Toolbox Assistant gives you rapid access to up-to-date information about the Macintosh API. It provides a complete reference to the managers documented in *Inside Macintosh,* including their data structures, routines, constants, and resources.

Toolbox Assistant is delivered using QuickView, which gives you extensive hypertext links for rapid, easy navigation and provides useful features such as copy text, fast full-text search, user annotations, and resizable windows.

This release updates the QuickView application to version 2.3e4; see the document QuickView 2.3e4 Release Notes for details. New databases have been added to the Toolbox Assistant package—OpenDoc, Open Transport, Cyberdog, and ODF. See the file Read Me First for installation and other information.

Coming soon to an About box near you,

Alex Dosher
alyx@apple.com

Designing Databases That Don't Suck

Saving Your Database's Interface in Eight Easy Steps

By Peter Bickford

A few friends gather at my place every couple of Friday nights to play poker, taunt each other with our widely varying musical tastes, and plot out the future of the technology industry. On one of these nights, Bryan Green, 4th Dimension (4D) database developer extraordinaire, got us going about the worst databases we'd seen. Horror story followed horror story, from the system that used a smiling house icon to mean "save record," to the airline reservation systems that seemed to take 25,000 keystrokes to key in ticket information. Two months later, I found myself giving a talk to the local 4D user group. It was an educational, inspirational piece that extolled the virtues of excellence, quality, and good human interface design, entitled "Designing Databases That Don't Suck."

To carry on the good fight against disastrous database design, I'm excerpting the salient points from that talk as this month's interface article.

Design for Data Entry

If your database is going to be a success, you've got to start by allowing people to get data into it easily. Designing for easy data entry is especially important, since data entry tends to be such a repetitive task. Any improvements you make here are magnified a thousand times, paying off every time the user adds a new record.

There are three parts to making data entry easier:

- limiting what needs to be entered
- making the actual typing easier
- preventing errors

Start by taking a hard look at your forms to see if all those fields are really necessary. The natural tendency when laying out a database is to err on the side of overinclusiveness when deciding what fields to put on a form. Moreover, once a field is added, getting rid of it is devilishly hard because you never know whether someone in the organization might be using it. As a result, most databases contain a reasonably high percentage of "noise" fields that subtly sap performance, lengthen the time required for data entry, and pose ongoing maintenance problems. You can prevent much of this by simply questioning up front whether each field is truly necessary or whether there is some other way of providing equivalent information.

Next, review each form for its efficiency of data entry. If the data is to be typed into the system from a paper form, do the two match in field order and layout? Even though you may feel your own organizational scheme is more logical, it's bound to frustrate the users no end if they must tab across dozens of fields in order to fill out adjacent fields from a paper form.

Another small but important factor in making your forms easy to fill out is the use of key filters, which do special formatting or typing restriction when users fill out certain types of information, such as dates or times. While key filters are generally a good thing, some are written in a way that causes users to switch constantly between mouse and keyboard, or else makes the typed numbers seem to slide from side to side as users enter new characters into the field. These situations may seem like small annoyances, but the extra keystrokes can add up to a big waste of time overall.

Even more important than saving keystrokes, however, is preventing error. If your form can catch problems as they're being typed, you may be able to save an order of magnitude in error-recovery time compared to finding the error after the user submits the form. You can also prevent the most common errors by giving users easy access to lists of legal values, either by having them choose from a list, by using a disambiguator, or by providing an icon next to the field that lets users pull up a list of legal values. (For details on disambiguator fields, see my article "The Joys of Disambiguating" in the March 1995 issue of *Apple Directions*.)

Finally, you can help users avoid the dreaded "required field missing" error by adopting a design convention that clarifies which fields are required and which are optional. An easy convention that works well in many cases is the use of boldface labels next to required fields and plain text for other field labels.

Make the Menus Make Sense

Never underestimate how much users rely on your menu bar to provide a road map to your database. If you really feel a need to torture them, a good start is to adopt the default behavior of too many database packages and change the menu bar every time the user activates a different window.

If you're one of those boring people who actually *likes* your users, however, you should make an effort at least to provide a basic structure that stays in place and gives the database a sense of predictability. The basic behavior should then be to simply enable and disable options as they apply at any given time. Only in special circumstances should you bring in new menus that apply to a given window (as OpenDoc does), and even then, the basic menu structure should not disappear.

On the subject of menus, be sure to check the *Macintosh Human Interface Guidelines* to make sure you're not misusing any of the standard menu items or Command-key shortcuts. One fine point here is that although databases typically do not allow you to create new files, too many developers use the New command in the File menu for creating new records. For example, if what is really being created is a new sales record, it would be better to have a New Sale command under a Sales menu, with some Command-key shortcut other than Command-N. Save the File menu for commands that really involve files.

For the full story on menu bar design, see one of my favorite articles, "Menu Bar Madness," in the November 1993 issue of *Apple Directions*.

Design for the User, Not the Database

In school we learned that the right way to design a database is to analyze the flow of data, map its structure into tables and relations, and make sure the database contains the functionality to maintain those tables. As

a result, we sometimes see database applications that are nothing more than a series of database tables, along with a generic menu that gives the user the ability to add, delete, view, or modify a given record in the table. If programmers design a database like this, it's either a sign that they were really in a hurry, or that they were skipping class the day the teacher pointed out that all that table structure stuff was meant as a theoretical foundation—not as something that the user should ever be exposed to.

An experienced database designer spends time with users, finding out how they really work with information to do their jobs. The users may talk about creating purchase orders, browsing real-estate listings, or even removing people from preferred customer lists if their payments are late. But normal people who are focused on doing a job will never talk about needing to "switch from view mode to edit mode in the processing history table to modify the current selection."

Put a Real Native Interface on Your Database

As a developer, you may believe you're working in 4th Dimension, Fox Pro, or FileMaker. Your users, however, think they're working on a Mac OS computer, and they will criticize your database application whenever it doesn't seem to live up to the standards of the platform. No matter what interface quirks your development environment has, it's your responsibility as a developer to try to deliver as authentic a Mac OS interface as possible.

In some database development environments, this means you must implement your own alert boxes, "code around" goofy window behaviors, or even paste in a standard system palette resource so that the users' screen colors don't shift around when the database is launched. The closer you can get to having your database work according to the rules of the native operating system (be it the Mac OS, Windows, or whatever), the less trouble your users will have learning and using it.

Feedback and Speed

No matter how impressive a database's performance is, it's human nature to want the product to work faster. Since you can never have enough actual speed, it's often necessary to use finesse to make the user feel as if your database is faster than it really is.

The trick is *responsiveness,* not just performance. When the user performs an action (such as clicking a button or making a selection), make sure that the program responds immediately—preferably within 0.2 seconds or less. A study I did a few years back showed that when a computer did not respond visibly to users' actions, users pressed the reset switch after only 8.5 seconds, having concluded that the computer was hung. Assuming that this is a bad thing for your program's proper functioning, you'd do better to display a watch cursor before that time period has elapsed. And if you want users to wait for more than a few seconds, display a progress indicator to let them know what's happening and how long they'll have to wait.

Avoid Toolbar Overkill

A well-designed toolbar can be a wonderful thing, giving users quick and easy access to your program's most commonly used functions. Unfortunately, today's developers have decided that if a few icons in a toolbar are nice, then 500 icons scattered across a dozen toolbars, palettes, and ribbons must be even better. Instead, the user is left with a screen full of clutter, vainly trying to guess which icon is which.

Look, folks, the fact that a big developer from the rainy Northwest feels compelled to ruin its applications' interfaces doesn't mean you have to do it too. If you decide your application could benefit from a toolbar, keep it simple. The optimal number of toolbar icons seems to be the old "magic number" of 7 ± 2 logically related "chunks"; for example, icons for left, right, and center alignment would count as one chunk. Anything more than this tends to weigh users down memorizing icons, rather than freeing them up to get work done with your program.

To meet this guideline, make sure your toolbar is dedicated to only the most common and generally useful items, not just the ones you can think up neat icons for. One particular hint toward cleaning up your toolbar is to nix those worthless Cut, Copy, Paste, and Undo icons, which everyone seems to add despite the utter lack of evidence that they're actually useful. The same goes for icons for such well-known File menu commands as New, Open, and Save.

Practice Good Visual Design

Let's face it, we developers may be good at everything from database architecture to C++ programming, but most of us are not artists. One of the smartest things you can do on a project is to hire a competent visual designer to redesign your program's displays.

If circumstances make this impossible, the next best course is to exercise prudent restraint. In particular, practice restraint when using grayscale and 3D effects in your human interface (in buttons, for example). Too many programmers get caught up in the "heavy bevel" look, piling dark grays and blacks into gothic form designs that ultimately do nothing more than obscure the information. Sometimes, less really is more. (For details on Apple's recommendations for a grayscale human interface, see the document *7/96 Apple Grayscale Appearance,* on the September 1996 Developer CD.)

Try It Out on Real Users

Finally, remember that a database will ultimately be measured by how well it meets the needs of the end-users. These are not usually the people who provide you with a list of requirements, or even the people who sign the check when the job is done. These are the folks who will spend hundreds or thousands of hours using the database to try to do their jobs.

One of the great mysteries of our time is why, in most database development efforts, developers are kept from actually meeting the people they are supposedly working to help. Sometimes, this is done to avoid giving the developer mixed messages about program requirements, or simply because meeting the end-users isn't deemed necessary. Despite the extra effort it involves for you as the developer, it's in your interest to absolutely insist on actual customer contact while you're developing the database. After all, repeat business depends on satisfying your customers—something that is notoriously hard to do if you never actually meet them.

Ideally, end-users will be involved from the product's conception through its final implementation and follow-up. Along the way, practice a number of "20-minute user tests" (see my "Usability Testing" article in the June 1994 issue of *Apple Directions*) to detect design problems before they have a chance to become catastrophes. Finally, use the results

you find. Your product will be better for it, and your users will be more understanding if they can see that you're actually looking out for their needs.

The Rewards of Good Database Design

Overall, database design is one of the roughest areas in terms of human interface. It's technically demanding, the tools are still too primitive, and the amount of work can be huge. That's probably why I have such a soft spot for the developers who manage to somehow overcome all these challenges. When database developers take the time and effort to really get an interface right, they're not only winning new customers and contracts, they're also helping to move the standard higher.

And heck, given some of the databases we've got today, higher standards can only be a good thing.

Till next time,
Doc

Peter Bickford is a senior scientist in Apple's Developer Consulting Group. If you have interface questions you'd like to address to him, send e-mail to bickford@apple.com.

develop

continued from page 10

and the ever-controversial Puzzle Page.

We hope you'll take the time to digest issue 28 of *develop* on the Web at **http://www.devworld.apple.com/develop/**, on this month's Developer CD, or in print if you've subscribed through the *Apple Developer Catalog*. Please let us know what you enjoyed or what didn't agree with you, by writing to us at develop@apple.com.

Caroline Rose
Editor, develop

Business

Marketing Feature: Now that nearly half of Mac OS–based computers have Internet access, it may be time to enhance your shelf-space position in "cyberspace." In this article, we provide you with details on specific services and utilities that can help you market your software and hardware products over the Internet.

Increasing Your Shelf Space in Cyberspace

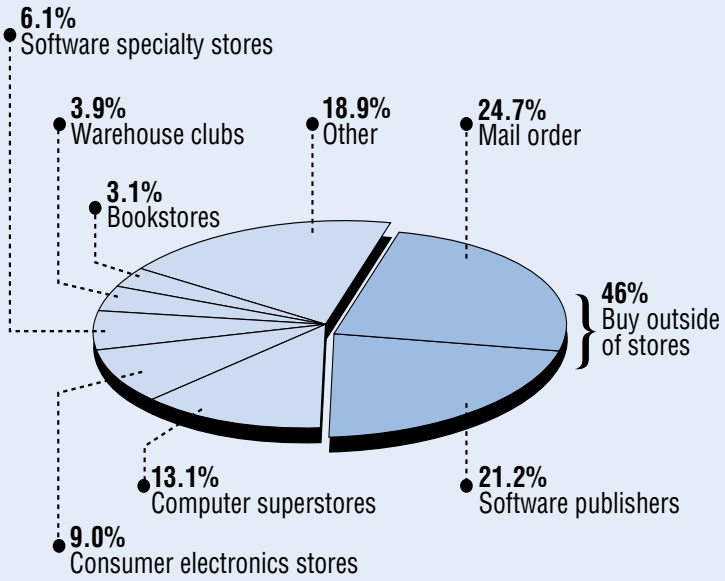
By Kris Newby, Apple Directions *staff*

When we were kids, getting shelf space was easy. We'd just place an old board over two milk crates, put up a "Lemonade for Sale" sign, and we were in business. For every product we sold, we'd get a smile, some kind words, and a few coins. If only it were as simple today. More often than not, software or hardware products pass from your hands to a publisher, a distributor, a retailer, and a detailer before they reach a customer. As each middleman takes a cut, you lose the smile, the kind words, and quite a few of those coins.

One nice thing about the Internet revolution is that it's made the acquisition of "cyberspace shelf space" about as easy as setting up a lemonade stand. Post your product demo or data sheet on a Web page, and you're in business. You get a bigger slice of the profit, and most satisfying of all, you get a more personal connection with your customers.

As an Apple developer, you're in a great position to capitalize on the various online distribution and marketing opportunities that are popping up everywhere. About half of the installed base of Mac OS–compatible computers have Internet access, and this number is growing rapidly (source: "1996 Macintosh User Profile"). And, as a group, Mac OS customers are more likely than their PC user peers to buy products from nontraditional channels (source: SofTrends, 1996). In this article, we discuss some of the new ways you can use the Internet to sell, market, and grab extra cyberspace shelf space for your products.

Where Macintosh Users Buy Software



Source: SofTrends' 1996 *Consumer Purchase Study,* which is based on questionnaires sent to 10,000 PC-owning households and covers software purchases made from November 1995 to February 1996. (For details on this exclusive data, contact Diane Freedman at diane_freedman@npd.com, or see the related article at **http://www.npd.com/soft186.htm**.)

Mac OS Users Spend More Time Online

Recent data from SofTrends shows that a large percentage of Mac OS users are quite comfortable buying software and hardware products outside the traditional channel. In fact, looking at the chart on this page, you can see that almost half the purchasers of Mac OS–compatible software buy software by mail or directly from software publishers, rather than buying it from a store.

Here's another important fact to keep in mind when you're thinking about online product marketing: This year more than half of the active Mac OS installed base will have Internet access. This data, which comes from the "1996 Macintosh User Profile" (**http://devworld.apple.com/mkt/informed/appledirections/aug96/userprofile.html**), shows that at the beginning of 1996, 40 percent of Macintosh users had Internet access, and that 39 percent of these users' systems were attached to modems that supported transmission speeds of 14.4 Kbps or greater—an important requirement for online software downloads.

Macintosh users are also spending quite a bit of time per week online. On average, active Mac OS users spend 10 percent of their computer time (two to three hours per week) accessing online services, the Internet, or e-mail (source: "1996 Macintosh User Profile").

Apple's internal market research group has also published CPU- and market-specific online data that may help you evaluate the promise of online marketing for your specific product niche. Here are some of the highlights of this report:

- 61 percent of Macintosh higher-education users access the Internet.
- 45 percent of Macintosh home users have online access, versus 36 percent of home

PC users. (Apple's market research group attributes Apple's advantage to Macintosh ease of use.)

- 42 percent of Macintosh business users have online access, compared to 41 percent of PC business users.
- Higher-education users and businesses with more than 100 employees spend the most time online, at just over three hours per machine per week.
- Users with PowerBook and PowerBook Duo computers spend 15 percent of their weekly computer time online (three and four hours per week, respectively).
- All Macintosh Performa computers now come with a modem and bundled online services, and their users spend about 15 percent of their weekly computer hours on online tasks (two hours per week).

(By the way, for a nice breakdown of overall Internet user demographics, see the "Netscape Navigator Users Demographic Profile," compiled by Griggs-Anderson Research, at the site **http://home.netscape.com/ads/demographics.html**.)

Looking at these statistics in your particular market, you may find that it's worth your time to begin laying the foundation for future online marketing or distribution plans.

Types of Online Opportunities

The core of this article is the "Directory of Online Opportunities," which begins on page 19. The purpose of this list is to provide you with a starting place for evaluating the varied types of online services that are out there today. All of the listed services can help you get more virtual product shelf space, and they're organized in these categories:

- in-store software download and preview stations
- Internet-based software stores
- demo CDs and Web sites

We've also listed a couple of utilities that can help you build your own function- or time-limited product demo. These utilities are especially useful if you opt for a strategy called *superdistribution*—where you post your demo on as many Web sites and CDs as possible, encouraging prospects to try your product before they buy it. And we've included a few Internet commerce service bureaus, which may be of interest to you if you're looking into setting up direct-order capabilities from your own Web site.

Finally, note that some of the online opportunities listed are free. For example, Apple Computer is paying the distribution setup fee for the first 50 OpenDoc Live Objects developers who sign up for the BuyDirect online software distribution service (products must be certified by CI Labs). Another free Apple comarketing opportunity is available if you sell PowerBook-related software: You can place software demos on the new Apple PowerBook Demo Toolkit CD. And, of course, free product listings are available to all developers on the new Web-based Mac OS Software and Hardware Guide. Browse through this article's list to find out about more free and low-cost opportunities.

Developer Benefits of Cyberspace Marketing

At first glance, there are numerous benefits to online software marketing and distribution. Some of the major benefits to having a strong online presence are

- worldwide sales and publicity at no incremental cost
- for online downloads, savings of packaging, manual, and shipping costs
- the potential for lower upgrade costs
- fewer middlemen, resulting in lower retail markups
- customer convenience and the ability to capitalize on "impulse buys"
- direct, more immediate customer information and feedback

Not surprisingly, many small developers have been the first to try online distribution.

One enterprising software entrepreneur who's taking a chance on an all-Internet marketing strategy is Adrian Russell-Falla, president of Europa Software (WebQuick), based in Portland, Oregon.

"When I started Europa Software after leaving Now Software, I wasn't interested in fighting any more distributor battles," says Russell-Falla. "Instead, I decided to start a direct-marketing Internet utility company, where we could make the core assumption that all our customers had Internet access and e-mail. Given this assumption, our current marketing strategy is to distribute a 15-day downloadable trial version of our product as widely as possible on the Web. After the trial period is up, a series of prompts asks users to pay for the product. Once they order the product, we provide them with a serial number that unlocks it. This approach is quite advantageous to a startup like ours. We don't have to pay for expensive packaging, retail end caps, and catalog ads. And because of our strong e-mail connection with users, we get immediate information on customer demographics and software bugs."

Frank Leahy of Digital Comet (CometPage and CometSite Internet editors) is also taking an all-Internet approach: "I'm going to use CNET's BUYDIRECT.COM service because it only costs $400 to sign up, they only take 20 percent above my wholesale product costs, and I think there will be good shopper 'spill-off' from CNET's other popular Web sites."

Another small developer, Bill Modesitt of Maui Software, says: "I want to write software, not be a salesperson. Once I heard about Software Unboxed (they take care of all the fulfillment and I receive a check once a month), I immediately joined. My sales have already increased."

Larger developers, who have a strong hold in the traditional channel, have been slower to enter the online fray. Mike Davison, Director of Market Intelligence at Claris Corporation, presents a viewpoint common to many large developers: "It's still very early in the online software distribution process. There are no demo formatting standards, so software developers are faced with the prospect of duplicating efforts for each online distributor. Most consumers still have slow dial-up lines, and corporations, which generally have high-speed download capabilities, are just starting to ramp up. Right now electronic distribution makes the most sense for small developers or developers with specialized applications or applets."

Online Distribution Issues

In reviewing our list of online opportunities, you may find it difficult to decide on a service company without further research. Many of them haven't been in business very long. (Most established software distributors are taking a wait-and-see attitude about online distribution, or their plans are still under development.) And without a track record, it's hard to tell which companies are going to serve your customers best, which will pay you on time, and so on. Another thing you'll notice is that there aren't yet any commonly accepted ways to transact online commerce, and this often makes it hard to compare any two services on equal terms.

Of course, the most obvious limitation to electronic software distribution today is the

narrow bandwidth of most current online connections. Online downloads are only practical for small applications and component software.

Another industry issue under debate is how the channel compensation model will change with online distribution. The traditional software channel consists of three tiers: the software publisher, the distributor, and the retailer. In this model, each tier gets a cut of the profit. The industry realizes that software delivered electronically costs less to produce than traditional boxed shipments; it just hasn't decided who will benefit from the windfall profit.

If you're interested in learning more about the latest industry proposals for online software distribution, check out the materials created by the Software Publishers Association (SPA) Internet special interest group. You can read them, along with their initiative document, "Electronic Licensing and Security," on the Web at **http://www.spa.org/sigs/internet**.

Another strong Internet commerce initiative is being spearheaded by Stream, LitleNet, BBN, and KPMG. You can review their proposal for electronic security and software clearinghouses at the KPMG Web site, located at **http://usserve.us.kpmg.com/ssc/archive/may96/story1.html**.

Setting Up Your Lemonade Stand

Today, the bad part about online software distribution is that it's a free-for-all with very few rules. But that's also the good part of online distribution. While others are hashing out Internet price structures and ad banner rates, you can get creative about grabbing some cyberspace shelf space of your own.

Try, for instance, trading ad banner space with a company that sells products complementary to yours. (One great example of a symbiotic swap is the Bungie Software game demo that ships with new Iomega Zip drives. Both companies win in this deal: Marathon sells more copies of its game, and Iomega reinforces its brand position as a fun, creative supplier of mass storage devices.) Or invest in a Web site with great content, so it gets linked to related sites or to multiple "Best Web Sites" lists. Also, place your product demo on as many free Web sites you can.

Cyberspace marketing is still in its adolescence, and there are an abundance of opportunities if you're willing to take some chances. So, when life sends you a bunch of lemons and you don't have as much retail shelf space as you'd like, build your own Web-based lemonade stand. ♣

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[Author's note: Apple Computer, Inc. in no way endorses or recommends the companies listed in this article. Listed companies are included only as a convenience to Apple Directions *readers.]*

Directory of Online Opportunities

Here's a list of online service and product providers, outside the traditional software channel, that can provide you with new ways to reach software buyers.

In-Store Software Downloads and Previews

SmartShelf From BITSource

Patent-pending technology allows SmartShelf to deliver software electronically to both corporate and retail customers, while avoiding the problem of limited Internet bandwidth. Customers submit orders using an online catalog accessed via the World Wide Web from either the reseller's retail floor or the corporate customer's IS department. Titles can be written either to a recordable CD or directly to hard disk. Corporate customers can obtain an in-house version of SmartShelf through their participating resellers. Pilot Smart Shelf systems will be installed in all 19 locations of the Houston-based reseller Computize during the last quarter of 1996.

Other benefits: A friendly, electronic sales "wizard," called *The Software Guy,* helps customers find products and special buys in the electronic catalog. If you're a developer, BITSource provides you with customer registration information, hot prospect leads, e-mail customer update notices, and weekly sales reports. You can include demos on CDs with related products.

Target market: All software users.

Cost: BITSource typically purchases products from developers at 32 percent off the electronic street price.

Contact: Rich Kline, 415-919-0652, rich@bitsource.com
http://www.bitsource.com/pub.html

STV Software Preview Stations From STV Communications

STV Software Preview Stations allow software shoppers to watch a 60-second video clip of software products at the touch of a button. These stations are currently located in a variety of retail stores, including BestBuy, Computer City, Fry's Electronics, Virgin Megastores, and Elek-Tek. The stations will soon be placed in Circuit City stores, and they will be tested in Borders, Media Play, and Lechmere.

Other benefits: STV provides developers with a shelf-detailing service, stock reports, and hit reports.

Target market: STV has three types of user-targeted stations: game software, family software, and productivity software.

Cost: About $35 to $50 per product, per outlet, per month (a fraction of the cost of a retail end cap).

Deadline: Programs run in 60-day cycles.

Contact: Melinda Moore, 310-337-3058, melindam@softwaretv.com

Internet-Based Software Stores

BUYDIRECT.COM From CNET Direct

This new Internet-only software service, scheduled to open this year, will specialize in the electronic delivery of software components, plug-ins, and Internet-oriented applications. CNET Direct's parent company, CNET, produces both Web sites and television programming focused on computers, the Internet, and digital technologies. CNET's Internet properties (including CNET.COM, NEWS.COM, SEARCH.COM, and SHAREWARE.COM) deliver more than 1.3 million Internet pages to browsers daily. SHAREWARE.COM also facilitates the download of over 150,000 software files per day. CNET Direct will utilize all appropriate links from other CNET properties to drive traffic to BUYDIRECT.COM.

Other benefits: BuyDirect offers secure online credit-card processing, 100 percent customer registration, and developer control over pricing and marketing messages. Phone and fax orders can also be accepted.

Cost: Nominal setup fee, flat commission on sales, plus credit-card processing fees.

Comarketing promotion: Apple Computer is paying the setup fee for the first 50 OpenDoc Live Objects developers who sign up with this service. (Products must be certified by CI Labs to be eligible.)

Target market: Web-savvy end-users and Web site developers.

Contact: Tom Mullen; 415-395-7805, ext. 1450; tomm@cnet.com
http://www.buydirect.com

Cyberian Outpost

This popular, Internet-only, multiplatform software store currently carries about 5,000 Macintosh products in all categories. The company estimates that about 5,000 shoppers visit the site each day. Cyberian Outpost also posts product reviews, demos, and screen shots, and sells related books and vendor merchandise. All products must meet Cyberian's product evaluation criteria.

Other benefits: The company accepts 800-number orders, purchase orders, and credit-card orders. Boxed and international shipments can also be initiated.

Cost: Cyberian Outpost purchases your products at the wholesale price, and no additional costs are required for a standard online product listing. Ad banner space is available at an additional cost.

Target market: Web-savvy end-users and companies.

Contact: Robert Rathbun, 800-856-9800, 860-927-2050, rdr@cybout.com
http://www.cybout.com/cyberian.html

Developer Depot From MacTech Magazine

Developer Depot is a Web-based mail order catalog that carries development tools for Mac OS developers. They fulfill orders via their Web site, e-mail, fax, and phone. This service is known for its tools-savvy customer support staff, and *MacTech Magazine* editor Neil Ticktin manages a related list server that can be used to notify Mac OS developers of new product releases.

Target market: Users of Mac OS development tools.

Contact: 800-622-3381, info@devdepot.com
http://www.devdepot.com

DigiCore

DigiCore, a worldwide mail order distributor of Apple and third-party Macintosh-compatible hardware products and peripherals, now has a Web site with a direct link from the popular Macworld Online site. DigiCore's emphasis is on hardware, and they often assemble custom configurations for graphics, video editing, network, and Internet server users.

Target market: Home, government, and *Fortune* 500 computer users. Dealers and consultants frequent DigiCore because of their volume discount programs.

Contact: sales@digicore.com; 800-858-4622 (U.S.), 818-785-2800 (international)
http://www.digicore.com

Enhanced CD Database and Music Store From Apple Computer and N2K

Apple, in conjunction with N2K, recently launched the Enhanced CD Database, a Web site where you can list your Enhanced CDs (hybrid CDs that consist of a mix of music and multimedia content). This site allows users to find and sample Enhanced CDs. In addition, using a link to N2K's online music store, Music Boulevard (http://www.musicblvd.com/), users of this database can immediately purchase Enhanced CDs.

Target market: Music lovers with computers.

Cost: None.

Contact: To learn how to submit your Enhanced CD to the database, visit the Web site listed below, then click on the words "Add Your Own ECD." For other program questions, contact Catherine Christofferson at catherine.c@apple.com.
http://www.musicfan.com/

Gamelan From EarthWeb

This free Java applet listing, which is sponsored by EarthWeb (a Web site developer) and Sun Microsystems, provides Java developers and users with a site where they can exchange Java-related ideas and software. Sun Microsystems, which created the Java language (now supported by Apple), has endorsed Gamelan as the premier registry and directory for Java applets.

Other benefits: Gamelan has just been integrated into the Yahoo Web site.

Cost: None.

Contact: Allison Fishman, 212-725-6550, allison@earthweb.com
http://www.gamelan.com

Netscape's DevEdge CD-ROM and AppFoundry Online

Netscape's DevEdge program offers developers several ways to promote their products. The DevEdge CD and AppFoundry Online Web site feature products and plug-ins developed by Netscape's DevEdge developer partners. (Listed developers benefit from the 85 million or so users who visit Netscape's Web site each day.) From this site, you can order Netscape's ONE Stop Software SDK, which can help you build enterprise applications on the Netscape ONE open network environment.

Target market: Users of Java applets and Netscape plug-in software. The AppFoundry site is frequented by enterprise and intranet developers.

Contact: Netscape DevEdge program information, 415-937-2986, devinfo@netscape.com, http://developer.netscape.com; for ad banner rates, 415-937-2555, or http://www.netscape.com/ads/index.html

PartBank From Kantara Development

This new Internet-only component software store features electronic product delivery and a search engine that helps customers find OpenDoc Live Objects and other software components. PartBank's setup fees are waived when you sign up to use CyberSource's COMPONENTS.SOFTWARE.NET site as your electronic reseller. Kantara also offers a software library that can be embedded in your product, enabling you to sell other products in your line using the Internet, phone, fax, or postal mail.

Target market: Customers who use software components, especially those with client/server solution needs.

Contact: Steven Roussey, 714-675-7327, steven.roussey@partbank.com
http://www.partbank.com

Programmer's Paradise

Programmer's Paradise, a popular reseller of software development products, has recently begun selling products directly over the Internet using CyberSource for its back-end commerce functions.

Other benefits: Programmer's Paradise offers credit-card processing, electronic fulfill-

ment, secure digital encryption, piracy protection, customer support, and reporting options.

Target market: All types of software developers.

Contact: Susan Orr, sorr@nj5.injersey.com
http://www.pparadise.com

Software Central From MacUser Magazine
This Internet-based shareware and freeware software directory features a nice search engine that calls up magazine product ratings and reviews. The best products are publicized in the "50 Best Shareware Programs" magazine insert.

Other benefits: Ad banner space is available to commercial developers for a fee.

Target market: Users of shareware and freeware.

Contact: Philip Dyer, 415-547-8637, philip_dyer@zd.com
http://www.macuser.com

Software.net From CyberSource Corporation
This established Internet-only software store currently has more than 1,500 software titles and components that it can deliver electronically for most major platforms. It also features a Web-accessible database of more than 20,000 titles. Customers can opt for boxed shipments or, if available, electronic delivery.

Other benefits: CyberSource can manage international export requirements. Ad banner space is available at the Web site.

Target market: Web-savvy end-users and companies.

Cost: Lower distribution costs than the traditional channel.

Contact: Rob Lewis, 800-617-7638, 408-556-9300 ext. 6018, robl@software.net
http://www.software.net

Software Unboxed From BroadCast Software Corporation
This online software site sells Mac OS, Newton, and Windows-based software electronically, by wrapping it in secure digital containers (requiring no alteration of a publisher's products). After trying a demo, a customer can unlock the software with a unique password obtained by e-mail (24 hours a day), phone, fax, or postal mail. Credit-card orders are accepted.

Other benefits: Publishers may use the technology to sell directly to their customers, or they may elect to have Software Unboxed handle fulfillment.

Cost: There are no startup costs. Publishers who sell directly to their customers realize margins in excess of 90 percent. Those who use Software Unboxed as a reseller realize margins of 65 percent. In either case, product listings on the Web and America Online (keyword *unboxed*) are free.

Target market: End-users, education customers, and businesses.

Contact: Fred Sturtevant, 541-317-0428, freds@broadcastsoft.com, http://www. broadcastsoft.com
http://www.unboxed.com

Stream International
This new online software store enables you to consolidate all aspects of software manufacturing, distribution, and technical support with one vendor. Stream's emphasis is on outsourcing their Web store technology and expertise to software and hardware developers.

Stream is the world's largest manufacturer, reseller, and technical support provider for computer software and related services. With major facilities in 17 countries, Stream offers a global one-stop solution for software developers. Stream is a founding member of the Electronic Licensing and Security Initiative (ELSI).

Other benefits: Stream encourages repeat Web site visits with end-user home-page creation and buyer loyalty programs. Ad banner space is available.

Target market: All users.

Cost: Contact for quotes.

Contact: Mike Berrigan, 408-982-8364, michael_berrigan@stream.com
http://www.stream.com

Demo CDs and Web Sites

Apple's Mac OS Software and Hardware Guide
This searchable directory of Mac OS products is located on Apple's corporate Web site. Apple Developer Relations plans to create CD and print versions of this guide for Apple's field representatives, channel partners, and customers. Entries older than one year will be deleted, so we suggest that you have a representative monitor your product entries on a quarterly basis.

Target market: All Mac OS users.

Cost: None.

Contact: Register your products through the Developer World site at http://devworld.apple.com/mkt/submission.html
http://www.macsoftware.apple.com

Apple's PowerBook Demo Toolkit CD
If you publish Mac OS–based software that would be of interest to Apple PowerBook users, then your demo software can be included, at no cost, on the new Apple PowerBook Demo Toolkit CD-ROM. This CD will be distributed worldwide to Apple field and sales agents every six months, as a way to help demonstrate the performance of PowerBook products.

All submitted software must be legally cleared within your company for worldwide distribution, and user instructions should be included with your submission. You are strongly encouraged to include localized versions of software and collateral as well.

Target market: Macintosh PowerBook users.

Deadline: Ongoing, every six months.

Contact: Tim Nelson at timbo@nellie.com or 408-358-6264. Send your software on a CD (preferred) or floppy disk to PowerBook Demo Toolkit, 100 Amanda Lane, Los Gatos, CA 95032.

CD-ROM Today From Imagine Publishing
This magazine is shrink-wrapped with a demo CD targeted at both PC and Macintosh home software users. Participation includes the potential for magazine-based product reviews.

Target market: PC and Macintosh home users (with an emphasis on PC users).

Cost: Contact for quotes.

Contact: Advertising, 415-468-4684

DigiZINE From Ahrens Interactive
This interactive CD, which is sold by subscription or through retail outlets, is positioned as a "cultural adventure." It features entertainment, music, technology, and cultural topics for an under-30-year-old audience. The CD is packaged in a magazine-sized folder and has an unusual interface that connects with *DigiZINE*'s Web site.

Target market: "Generation X" computer users interested in music, cultural issues, and movies.

Cost: Contact for quotes.

Contact: Kelly Cleveland, kcleveland@ahrens.com, 312-494-3442
http://www.digizine.com

MacAddict From Imagine Publishing
This new magazine includes a hip Web site and an accompanying CD that features demos, shareware, resources, and contests. Ad banners are available on the Web site and CD.

Target market: Intermediate to advanced Macintosh home users. (Imagine Publishing publishes five other computer-related magazines.)

Cost: Contact for quotes.

Contact: Andre Langyel, 415-468-4684 ext. 416, alangyel@macaddict.com
http://www.macaddict.com

MacCentral Showcase From MacCentral Communications
MacCentral Communications, based in Halifax, Nova Scotia, recently went online with a new Macintosh content area on its popular Web site. This area includes Macintosh news, software updates, and in-depth product information, and it provides a high-visibility forum for developers seeking publicity for new products. This offering is truly a showcase: MacCentral Showcase features only one product at a time.

Target market: All users.

Cost: You can feature your product on this Web page for $200 per week. MacCentral encourages you to post in-depth product information, including behind-the-scenes information, special offers, exclusive screen shots, "tips and tricks" reports, frequently asked questions, and so on. For an additional $200, MacCentral will place your ad banner on its home page, which receives about 70,000 viewer hits a week. Developers who have advertised at MacCentral Showcase report being satisfied with the results; in fact, one Showcase developer reported 4,000 hits in one two-day period.

Contact: Dave Moser at 609-234-6789, ext. 104, or market@maccentral.com
http://www.maccentral.com

MacFormat From Future Publishing
This *MacAddict*-like publication is Britain's bestselling Macintosh magazine. Its accompanying CD includes demos, utilities, shareware, reviews, and more.

Target market: *MacFormat* targets a broad range of U.K.-based Macintosh users. It's slightly more technical than *The Mac,* though it reviews a lot of children's software and games.

Cost: Contact for quotes.

Contact: Belinda Symington, +44 01225 44.22.44, netads@futurenet.co.uk
http://www.futurenet.co.uk/

The Mac From Dennis Publishing
The Mac is a *MacUser*-like publication published in London, and its accompanying CD includes demos, updates, shareware, reviews, and more.

Target market: *The Mac* targets general Macintosh users, primarily in the United Kingdom, though they have some overseas subscribers. It's slightly less technical than *MacFormat.*

Cost: If your demo is selected by the magazine's editors, it's placed on their CD for no charge. Priority is given to first-run, exclusive product demos.

Contact: Tony Smith, deputy editor, +44 171 917.76.97, editor@themac.co.uk
http://www.themac.co.uk/themac/

MacHome Journal CD Sampler From MacHome Journal
MacHome Journal periodically publishes demo CDs with the magazine, and this holiday season, the demo CD will also ship with Macintosh Performa boxes.

Target market: Macintosh home users.

Deadline: Call for details.

Cost: About $350 to $400 per MB on the CD.

Contact: Susan Ford at *MacHome Journal,* 415-957-1911, ext. 14, susan_ford@machome.com

Macworld Web Explorer Virtual Product Expo CD From IDG
You can place your product videos, demos, product information, and Web site links on this widely distributed *Virtual Product Expo* CD. The first CD will be distributed with the January issue of *Macworld* (available on December 1). Developers with free listings in Apple's Macintosh Product Guide database will be included on this CD. The Expo will be moved to a Web-based program on December 1.

Macworld has also just launched Macworld Club, a members-only user group that features a good Web site for product promotions and ad banners.

Cost: Macintosh Product Guide product listings are free (through Apple); "virtual booths" (through *Macworld*) range from $3,600 to $10,400.

Deadline for the May 1997 CD: January 15, 1997.

CD "booth": Cherie LaFrance, 408-688-0707, cherie_lafrance@macworld.com
http://www.macworld.com/index.shtml
http://www.webexpo.macworld.com

Scripting Resources Web Site From Late Night Software
Late Night Software, a developer that markets a number of AppleScript development tools, is compiling a Web-based list of AppleScript utilities, books, and scriptable applications. If your product is scriptable or related to AppleScript, the company would like to include you on its site. Just send your company name, Web site address (URL), company contact information, a list of scriptable products, and a brief paragraph describing each product. Try to keep your product descriptions under ten lines, and indicate whether each is a commercial, freeware, or shareware product.

Target market: Anyone who uses AppleScript or other scriptable products.

Contact: Mark Alldritt, alldritt@wimsey.com
http://www.latenightsw.com/scripting.html

SPA Software Industry Directory From SPA
The Software Publishers Association (SPA) recently launched an online, searchable product directory to help consumers and industry people access up-to-date information on software companies, products, and services. SPA members are listed first in all searches, have direct links to their home pages, and have the opportunity to display their company logos on their directory listings. In the near future, this directory will offer enhancements, such as detailed product information and the ability to search the directory in a variety of ways. Once users have located the information they are seeking, a link often takes them to the Web home pages of the appropriate companies.

Target market: Software consumers and industry people.

Cost: Free directory and product listings are provided to all SPA member companies. Companies that are not members of SPA may take advantage of free listings until March 31, 1997. Web site ad space is also available on a limited basis; SPA will sell no more than eight ad slots at a time. Rates range from $400 to $850 a month, depending on your membership status.

Contact: To place an ad, contact Jane Fort, SPA's marketing representative, at 301-341-3588. For more information, request document #135 on the SPA fax-on-demand service at 800-637-6823. To obtain a free directory listing, non-members should complete the online registration form at **http://www.spa.org/member/dir.htm**

Other Internet Distribution Resources

iCat Electronic Commerce Suite From iCat Corporation

iCat's Electronic Commerce Suite provides everything a company needs to get a fully functional Internet-based catalog up and running in just a few hours. This product was recently awarded the *Macworld* Editors' Choice Award for the best software for building a dynamic Web site.

Other benefits: To help with secure electronic transactions, iCat has relationships with Checkfree Corporation, First Virtual, NETCOM, Open Market, and other electronic commerce partners.

Cost: iCat's single-user version is available for $1,495. Check iCat's Web site for more details on all product offerings.

Contact: In the United States, 206-623-0977, moreinfo@icat.com; in Europe, +44 0181 387.40.70; in Japan, +81 3 35.86.28.80
http://www.icat.com

Internet Commerce Solution From Digital River

If you're a small company that wants the appearance of having a full-service direct sales group, but you don't have the resources to start one, Digital River provides you with a solution. This company can set up and maintain an electronic-ordering Web site that transparently fulfills product orders under the guise of your company.

Other benefits: Digital River fulfills boxed, electronic, and international product shipments.

Target market: Heavy Web users.

Cost: Digital River provides you with a less expensive alternative to setting up your own order-fulfillment Web site, which is often important for cash-strapped startup businesses. (To see an example, click the order button of a typical customer site at http://digfrontiers.com.)

Contact: Todd Frostad, 612-832-5622, ext. 336, frostad@tech2.com
http://www.digitalriver.com

SalesAgent From Release Software Corporation

SalesAgent is an embedded sales tool designed for developers interested in exploiting the try-before-you-buy sales paradigm. It allows developers to create time- or feature-limited trials, then walks users through a simple registration and sales process after the trial is over. Software can be delivered and purchased instantaneously. Release software offers full transaction services, which include purchasing via the Internet, modem, phone, fax, or mail. Because SalesAgent becomes a part of an application, it travels everywhere the software goes. If the software is copied, the program launches back into trial mode, which, in turn, creates additional selling opportunities.

Cost: Contact for quotes. A free demo is available on the company's Web site.

Contact: Helen Nigg, marketing manager, 415-833-0200, helen@releasesoft.com
http://www.releasesoft.com

SoftLock Technology

With this company's product, you can freely distribute a copyable, partially readable product demo that instantly becomes a full-featured product with the purchase of a password. SoftLock-modified products automatically revert to demos when copied to another machine. Product purchasing and password disbursement can be managed by you or by SoftLock.

Cost: Call for quotes. The company also distributes a SoftLock Macintosh Programmer's Toolkit.

Contact: SoftLock Services, 716-242-0348
http://www.softlock.com ♣

Internet Resources for This Issue

News

- SPA databases—**http://www.spa.org/member/dir.htm**
- Press release on Apple-Sun alliance—**http://product.info.apple.com/pr/press.releases/1996/q4/960918.pr.rel.sun.html**
- Download site for alpha version of Mac OS Runtime for Java—**http://www.devtools.apple.com/mrj/**
- Third-party products featured in "All great software wears this face" campaign—**http://www.macsoftware.apple.com**
- Press release on PowerBook 1400 series—**http://product.info.apple.com/pr/press.releases/1997/q1/961021.pr.rel.pb1400.html**
- Mac OS Software and Hardware Guide—**http://www.macsoftware.apple.com;** registration—**http://devworld.apple.com/mkt/submission.html**
- Press release on new Performa computers—**http://product.info.apple.com/pr/press.releases/1997/q1/961017.pr.rel.performa.html**; new Performa Web site—**http://performa .apple.com/**
- MessagePad 2000 press release—**http://product.info.apple.com/pr/press.releases/1997/q1/961028.pr.rel.msgpd2000.html**
- Press release on HotSauce and HotSauce MCF—**http://product.info.apple.com/pr/press.releases/1996/q4/960918.pr.rel.internet.html**
- Download site for HotSauce fly-through plug-in—**http://hotsauce.apple.com**
- OpenTransport 1.1.1 download site—**http://devworld.apple.com/dev/opentransport/Download/OT1.1.1.sea.hqx**
- OpenTransport 1.1.1 press release—**http://product.info.apple.com/pr/product.updates/1997/q1/961025.prd.updt.opentrans.html**
- Press release on System 7.5.5 Update—**http://product.info.apple.com/pr/product.updates/1996/q4/960919.prd.up.sys7.5.5.html**
- Press release on Advanced Chinese Input Suite (ACIS)—**http://product.info.apple.com/pr/press.releases/1997/q1/961009.pr.rel.chinese.html**
- Press release on Singapore award for Chinese Dictation Kit—**http://product.info.apple.com/pr/press.releases/1996/q4/960905.pr.rel.award.html**
- *Web Week* article on Web site design and the Mac OS platorm—**http://www.webweek.com/96Oct07/undercon/designsurvey.html**
- Press release on eMate 300—**http://product.info.apple.com/pr/press.releases/1997/q1/961028.pr.rel.emate.html**

Technology

- Issue 28 of *develop*—**http://www.devworld.apple.com/develop/**

Business

- Article related to SofTrends' 1996 Consumer Purchase Study—**http://www.npd.com/soft186.htm**
- 1996 Macintosh User Profile—**http://devworld.apple.com/mkt/informed/appledirections/aug96/userprofile.html**
- "Netscape Navigator Users Demographic Profile"—**http://home.netscape.com/ads/demographics.html**
- The SPA Internet special interest group's initiative document, "Electronic Licensing and Security"—**http://www.spa.org/sigs/internet**
- KPMG Web site—**http://usserve.us.kpmg.com/ssc/archive/may96/story1.html**
- BITSource's SmartShelf—**http://www.bitsource.com/pub.html**
- BUYDIRECT.COM—**http://www.buydirect.com**
- Cyberian Outpost—**http://www.cybout.com/cyberian.html**
- *MacTech*'s Developer Depot—**http://www.devdepot.com**
- DigiCore—**http://www.digicore.com**
- Apple's and N2K's Enhanced CD Database and Music Store—**http://www.musicfan.com/**
- N2K's online music store, Music Boulevard—**http://www.musicblvd.com/**
- EarthWeb's Gamelan—**http://www.gamelan.com**
- Netscape's DevEdge CD-ROM and AppFoundry Online—**http://developer.netscape.com**; ad banner rates—**http://www.netscape.com/ads/index.html**
- Kantara Development's PartBank—**http://www.partbank.com**
- Programmer's Paradise—**http://www.pparadise.com**
- *MacUser*'s Software Central—**http://www.macuser.com**
- CyberSource's Software.net—**http://www.software.net**
- BroadCast Software's Software Unboxed—**http://www.unboxed.com**
- Stream International—**http://www.stream.com**
- Apple's Mac OS Software and Hardware Guide—**http://www.macsoftware.apple.com**
- Ahrens Interactive's DigiZINE—**http://www.digizine.com**
- Imagine Publishing's MacAddict—**http://www.macaddict.com**
- MacCentral Communications' MacCentral Showcase—**http://www.maccentral.com**
- Future Publishing's MacFormat—**http://www.futurenet.co.uk/**
- Dennis Publishing's *The Mac*—**http://www.themac.co.uk/themac/**
- IDG's Macworld Web Explorer *Virtual Product Expo* CD—**http://www.macworld.com/index.shtml** **http://www.webexpo.macworld.com**
- Late Night Software's Scripting Resources—**http://www.latenightsw.com/scripting.html**
- SPA Software Industry Directory—**http://www.spa.org/member/dir.htm**
- iCat Electronic Commerce Suite—**http://www.icat.com**
- Digital River's Internet Commerce Solution—**http://www.digitalriver.com**
- Release Software's SalesAgent—**http://www.releasesoft.com**
- SoftLock Technology—**http://www.softlock.com** ♣