

variant of general educational usage, is one promising area. Lotus is shipping a CD-ROM version of their 1-2-3 spreadsheet product that provides multimedia smart help. Its ideal is to provide JIT "just-in-time" training to a user where and when they need it. Intuit's *Quicken* financial management program also is available with a similar training function on CD-ROM. Businesses are also starting to publish their own CDs with presentation material for internal distribution.

Where multimedia shines is as a reference tool. The storage capacity of the CD-ROM and the search and matching capacity of a computer can provide access to material faster than with a conventional book index. Atlases, dictionaries and encyclopedias of all levels of sophistication are available on CD-ROM. Compton's New Media is testing an *AAA Trip Planner* that allows drivers to plan trips throughout the US with route maps, restaurant, hotel and scenic attraction information. Microsoft's *Encarta*, based on the Funk and Wagnall's encyclopedia, has sold over 350,000 copies beyond those bundled with multimedia machines. It boasts 26,000 articles, 8 hours of sound, 7000 illustrations and photos, 100 animations and film clips, 800 maps and 250 interactive charts and tables. Microsoft has brought out various other reference titles like *Cinemanía*, a collection of movie reviews, *Art Gallery*, a guide to the collection of the National Gallery in London and *NBA Basketball*, with information on players, teams, championship seasons and statistics.

Multimedia can also augment the traditional adult reading, listening or viewing experience. The Voyager Company specializes in this type of contextual multimedia. One title, *Antonin Dvorak: Symphony No. 9 "From the New World"* offers an audio recording accompanied by the complete score that scrolls by as the music plays along with essays and illustrations exploring the folk rhythms and scenery that inspired Dvorak. Voyager offers other titles that add supplemental material for movies and books.

Unfortunately, the bulk of the multimedia titles are disappointing and empty mind candy. But when a TV program like *Baywatch* garners a billion viewers worldwide, maybe that is to be expected. Even some of the better titles have blemishes. For example, Microsoft's *Ancient Lands* overlooks civilizations in India, China, and Meso-America. Multimedia is still a technology in search of its own appropriate format.

Manufacturers have been surprised that most of the multimedia PC have been purchased for home use and not by businesses. Much multimedia software is still "yuppie-ware" geared to what Microsoft's marketing department euphemistically terms the "loosely supervised professional". It is only fitting that most multimedia discs are sold to "DISCs," couples with Dual Incomes and Small Children. These families can afford the expense and are looking for educational enrichment opportunities for their children even if most of the software is more entertainment than reference and exploration.

Why the Hype?

The notion of using computers to process "non-traditional" forms of data is not new. Like the invention of the computer mouse and desktop publishing, multimedia was developed over two decades ago at universities and research labs in Silicon Valley. Compact Discs were invented at Philips in the Netherlands over 10 years ago. Why then is multimedia

now the hot technology in the computer market? The answer is simple and twofold: cheaper technology and fatter profits. Microprocessors, the brains of personal computers, get twice as powerful at the same price every three years. So inexpensive computers are now able to handle the data rates necessary for multimedia that would previously require expensive, specialized equipment. High performance "multi-spin" CD players are now much cheaper and more available. Media Vision and Sony even have clever little models that are portable and battery-powered to travel with laptop computers.

But a convergence of market factors is the real force that is driving multimedia into consumer mass consciousness. To encourage upgrading, Intel is concerned that applications exist to soak up all the extra processing power that their new microprocessors, like Pentium, deliver. Towards that end, Intel has promoted multimedia and specifically video applications. Hardware manufacturers like Compaq, Apple, IBM, and Dell are fighting price wars on standard PCs. Multimedia-equipped PCs are still much more profitable than standard units that have become a low-margin generic offering.

Making a major push into CD-ROM publishing, Microsoft has announced 100 titles so far. The sales in core office applications and operating systems business has plateaued, so Microsoft's strategy to maintain the growth rates it had in the 1980's is to enter and build the home multimedia market. Other major players promoting multimedia have come from within the traditional publishing industry. Random House and Simon & Schuster, for example, have put significant investment into their multimedia publishing divisions this year. The carrot for the publishing industry is also bigger margins. Popular CDs are enormously profitable. Although it can take up to a million dollars to develop, a new game title, a typical CD title retails at between \$49.95 and \$129.95 and costs only 60 cents to manufacture and package.

The Outlook

Will multimedia have the same promise as the AT&T PicturePhone that debuted at the 1939 World's Fair and was never commercialized, or will multimedia gain the market acceptance and profitability that hardware manufacturers and software publishers are banking on? Much depends on making multimedia hardware and software easier to install and more reliable to use. Today, few customers are willing to upgrade their existing computers to multimedia capabilities. Even though manufacturers are easing the pain by offering complete kits and 24-hour 800-number help lines, upgrading can still be frustratingly difficult. Microsoft's upcoming version of Windows promises a "plug and play" capability that eventually make hardware upgrading safer and easier. But it will take years for Windows-compatible hardware makers to fully adopt the new standard.

To be successful in the long term, programs will also need to be designed to be more "crashproof" so they don't become sluggish, jerky, or lock up and freeze the computer altogether. Multimedia software has to be much cheaper and simpler to author and have much wider channels of distribution than the software specialty outlets that carry it today. Buyers need access to timely and accurate reviews of new multimedia titles. They are rejecting "shovelware," titles that just collect vast amounts of data and programs on CD, and are also wary of software that needs multiple CDs to contain all the data. Companies

will have to consistently deliver quality of content that they publish in the new multimedia formats and provide dependable assurance of the accuracy and reliability of the materials to maintain repeat sales and avoid liability. Unlike textbooks, no committee of scholars reviews CD titles for suitability as learning tools.

Companies will also have to deal with resistance to upgrading to new technology. Current CDs are already obsolete just as CD players are becoming commonplace. Technology exists to store five times the data (enough to store an entire movie on one disk) on the same CD-sized platter and Sony has just begun shipping floppy disk-sized optical drives that can be used to store data by users and not just hold pre-published programs.

But the promise of multimedia might be realized with a combination of CD-ROM programs that can work with the growing facilities offered on the evolving "information highway." The University of Illinois has developed a simple graphical user interface program, *Mosaic*, that provides multimedia services to the Internet while masking its awkward complexity. This fall, to supplement and enrich its own published material with pictures, video, and music, the Encyclopaedia Britannica introduced a service for college students that uses Mosaic to link its new online edition of its encyclopedia with diverse, but authenticated, multimedia sources on the information highway. For example, a student referencing the encyclopedia article on art would be automatically linked to the Louvre Museum and be able to access high-quality reproductions of art from the museum's collection. This kind of network-enhanced application has value far beyond the hunt and slash games available today.

So then, is multimedia right for you? If you are a technophile, you probably already own a system along with a shelf full of titles and are a candidate for carpal tunnel syndrome treatment. If you are an early adopter with school-age children, the incessant din of advertising might sway a Christmas arrival of CD-ROM gear. If you prefer others have the fun of smoothing the rough edges off a new technology, then in several years you will find delivery of media-rich content coming to your home in the form of interactive television services.

Details-Details-Details If you are considering buying or upgrading to a multimedia personal computer, here is some techno-talk to remember. To be compliant with the latest industry standard MPC level 2, a IBM-compatible multimedia PC now requires Microsoft Windows 3.1 on a 486SX CPU running at 25MHz or higher, at least 4 MBytes of RAM, a double-spin CD-ROM player, a 240 MByte hard drive, an S-VGA display, and an 16-bit audio sound card with speakers. Apple Macintosh users need computers with 25-MHz 68030 processor or better, System 7.0, 5 MBytes of RAM, a 13" color monitor and a CD-ROM (preferably double speed). The new Apple Macintosh 630 series are optimized advanced multimedia functions, including direct video in/out. Before buying any CD-ROM title, check the package carefully to determine that it will play on the type and level of computer equipment that you own. Unfortunately, Apple and Windows multimedia titles are generally not compatible; however, some releases will work on both. **Warning:** Constant playing of computer games can atrophy social relationships.

