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THE JOURNAL REPORT: TRENDS

*Consumer Electronics***It All Connects -- and Converges**

By GARY MCWILLIAMS

Staff Reporter of THE WALL STREET JOURNAL

January 31, 2005

The march of digital technologies through cameras, video and a flurry of gadgets is reshaping old standbys and broadening their use.

Clock radios are turning into überstereos, and cameras into slim wonders that beam images to a TV or printer. Television, which had evolved only gradually since the advent of color in the 1950s, is now a digital jungle of new screen types, shapes and technologies.

THE JOURNAL REPORT

See the complete [Trend report](#).

Here's a look at those and other major trends under way.

1. The Well-Connected**Home**

The home is becoming a digital network. Consumer-electronics makers are weaving into their products communications capabilities that allow music, video and Internet access to travel electronically from room to room. New devices are cropping up that allow PCs to connect to stereos and TVs via high-speed wireless networks or existing power lines.

[Hewlett-Packard Co.](#), Palo Alto, Calif., and [D-Link Systems Inc.](#) of Fountain Valley, Calif., sell media adapters that use wireless broadband frequencies like Wi-Fi to beam recorded TV programs, home movies, photos, or MP3 music files stored on a PC to stereos or TVs directly connected to the adapter. The catch is that these devices work best with new digital TVs, or with PCs running [Microsoft Corp.](#)'s Media Center Edition 2005 software.

There are other wireless links that don't require a PC at the center. [Sony Corp.](#)'s LocationFree TV uses Wi-Fi to transmit TV, movies and Internet pages from a base station -- which receives, processes and sends a TV signal -- to a portable liquid crystal display, or LCD, screen. A base station connects to a DVD player, a digital video recorder like TiVo or a broadband Internet connection, streaming recorded videos, TV programs or Internet pages up to 50 feet away from the station.

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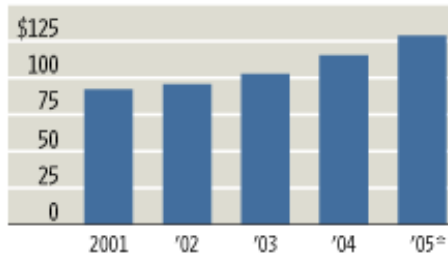
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Digital Demand

Shipments of digital TV, radio and stereo products to U.S. retailers, in billions



Digital television soars as prices fall

	UNIT SALES (MILLIONS)	SALES (BILLIONS)	AVG. PRICE
2001	1.5	\$2.65	\$1,812
2002	2.5	4.28	1,688
2003	4.1	6.52	1,590
2004	7.3	10.66	1,458
2005*	20.2	19.23	950

*Projected Source: Consumer Electronics Association

Japan's [Sharp Corp.](#) recently demonstrated the simultaneous transmission of high-definition TV and Internet access using electrical lines. This power-line network sends digital signals across existing copper wires, turning a home's electrical wiring -- with a node plugged into an outlet -- into a network. Sharp says it will be available in 2006 in the U.S., Japan and Europe.

2. A Cellphone That's a TV That's a...

Thanks to digital technologies, combinations of

unrelated products are becoming commonplace.

Cellphone makers are embracing convergence most emphatically, adding cameras, music players, e-mail and video access to the cellphone. And they aren't done experimenting yet. Recently, Finland's [Nokia Corp.](#), Samsung Electronics Co. of South Korea and Dallas-based [Texas Instruments Inc.](#) have exhibited prototype cellphones with tiny TV receivers, paving the way for a commuter to watch the evening news on the train ride home.

Meantime, the combination of voice and high-speed Internet technologies should become more commonplace in many networked homes this year. Services like [AT&T Corp.](#)'s CallVantage Service and Vonage Holding's Internet Phone Service -- which allow calls to be placed via computer -- are now solid alternatives to long-distance carriers.

3. Keeping Tabs

Devices that more easily track people's whereabouts are on the rise.

Cellphones equipped with global-positioning-system devices can allow parents to track phone-toting kids by using services that store the location data and provide details for a fee on a Web site. Some rental cars are now equipped with black boxes that record the speed at which the vehicle is traveling, so rental companies can identify lead-footed drivers.

Technology already exists to help locate lost pets using chips that can be placed under the skin. And it's likely to be used for children in the

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Dow Jones, Reuters

Hewlett-Packard Co. (HPQ)

PRICE	20.04
CHANGE	0.47
U.S. dollars	10:54 a.m.

Microsoft Corp. (MSFT)

PRICE	26.22
CHANGE	-0.24
U.S. dollars	10:59 a.m.

Sony Corp. ADS (SNE)

PRICE	36.61
CHANGE	-0.38
U.S. dollars	10:53 a.m.

Nokia Corp. ADS (NOK)

PRICE	15.53
CHANGE	-0.16
U.S. dollars	10:54 a.m.

Texas Instruments Inc. (TXN)

PRICE	23.07
CHANGE	-0.42
U.S. dollars	10:54 a.m.

AT&T Corp. (T)

PRICE	19.59
CHANGE	-0.01
U.S. dollars	10:54 a.m.

Cisco Systems Inc. (CSCO)

PRICE	17.70
CHANGE	-0.45
U.S. dollars	10:59 a.m.

* At Market Close

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near future. "The ability to monitor [children] with implants will be an overwhelming desire of parents in the future," says Art Fritzson, a vice president who tracks emerging technologies at consulting firm Booz Allen Hamilton in McLean, Va.

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4. The Big Small Picture

Digital television sets are unleashing a wave of innovation not seen since the early days of the tube. And consumers can't get enough of big TVs.

Market researcher iSuppli Corp., El Segundo, Calif., says sales of 40-inch and larger sets will about double to 14.4 million units in 2007 from 7.3 million last year.

Where traditional TV sets using a cathode ray differed largely by screen size, high-definition TV sets offer three new flavors: LCD, plasma and microdisplays, a digital technology that uses chip-based displays and bright bulbs to craft an image. And sizes range from 30 to 71 inches.

While none of the flat-panel technologies yet dominate, the fierce rivalry for consumer dollars among LCD, plasma and microdisplay sets is pulling down prices in unprecedented fashion. A high-definition-ready plasma set that cost \$6,000 four years ago now goes for \$2,000. The average price for a 32-inch LCD TV fell 37% to \$2,379 last year from 2003, according to iSuppli. Microdisplays, which had been among the least expensive of the big TV sets, owing to their less-costly screens, also are falling in price due to higher volume and competition from plasma TVs.

5. One-Stop Storage

Electronics consumers are looking to a digital cupboard that holds all of their media -- music, movies and television programming -- in one spot.

Currently, even if all of a user's components are connected with a home network, a consumer must still store MP3 digital-music files on a PC, save the latest episode of "Desperate Housewives" to a digital recorder and use the cable box to store that evening's pay-per-view movie.

But several alternatives are now popping up. Microsoft's Media Center Edition software uses a souped-up PC as the cupboard, transmitting music files, recording TV programs and becoming a secure repository for storing home movies. D&M Holdings Inc.'s Denon brand offers the MediaServer NS-S100, which fits in a closet and sends music and video to networked stereo systems and TV sets. Computer users are using low-cost boxes to offload media files from PCs. These include the Network Storage Link, made by [Cisco Systems](#) Inc.'s Linksys unit, and the Mirra Personal Server, from Mirra Inc., Sunnyvale, Calif.

6. Smaller and Smaller

Gadget lovers crave portability. And to further shrink already-portable devices, electronics makers are using Secure Digital memory cards and hard-disk drives to replace bulky tapes and optical discs.

The most popular MP3 digital music players employ so-called microdrives that can store thousands of songs. Camera makers have almost universally switched to postage-stamp-size Secure Digital memory cards for recording digital pictures. Now, these ultrasmall devices are on the verge of reshaping camcorders, cellphones and perhaps even video.

[Toshiba](#) Corp. of Japan, which makes a 1.8-inch hard drive for the iPod, recently introduced a 0.85-inch device that is expected to show up in camera phones this year. [Victor Co. of Japan](#)'s JVC brand has already introduced a camcorder that records video to a microdrive in place of the miniDV tape. Samsung has demonstrated camera phones with Secure Digital memory cards or microdrives.

Some think that the ability to put more storage in ever-smaller devices could wind up replacing DVDs for movie rentals or augmenting cable TV. For instance, TV makers are looking at offering TiVo-like store and replay services by incorporating tiny hard drives into their TV sets.

7. Point and Shoot – and Record

The decision on whether to take a still camera or camcorder for a weekend trip may soon become moot. Advances in imaging software and beefier memory cards are leading to the rise of "camera-corders," which can produce sharp 8-by-10 photos as well as DVD-quality video.

These camera-corders can shoot still photos and then, at the flip of a switch, record movies and sound. These hybrids are becoming possible due, in part, to better components and video-compression software. The devices are showing up with imagers that have resolution of three megapixels or better. And thanks to improved software, they capture video at 30 frames a second on inexpensive memory cards and minidisks. (TV is about 24 frames a second.)

Helping make these devices catch on are the rapid gains in memory cards. In the future, cards that hold two, four and eight gigabytes could provide several hours of high-quality video -- compared with current one-gigabyte cards that cost under \$100 and can store 20 minutes of DVD-quality video.

8. What's Your (Digital) Frequency?

The lowly transistor radio is getting a makeover with digital encoding that will allow it to capture digital signals.

This year, radio stations are making a big push to broadcast ultracrisp high-definition signals over existing frequencies. So far, about 200 stations have gone live with digital broadcasts, offering the same content in both analog and digital.

Manufacturers including JVC, Kenwood Corp., [Matsushita Electric Industrial Co.](#)'s Panasonic Corp. and [Sanyo Electric Co.](#) are introducing car radios that accept these high-definition signals. And [Boston Acoustics](#) of Peabody, Mass., and Marantz, a unit of Japan's D&M Holdings, are promising digital radios for the home this year. First versions could be pricey, about \$500, given the small number of companies making the needed chips and sets.

9. Join the Club

Weaving social networks around electronics products -- once just for hard-core gamers -- is going mainstream.

By offering events and dedicated Web sites, product developers are hoping to create communities of enthusiasts who otherwise might not find one another. The ultimate goal is to build buzz -- and sales.

The movement emerged from PC role-playing software such as Quake, made by id Software Inc. of Mesquite, Texas. As these programs moved from early single-player games to multiplayer and local-area-network versions, players started to compete against one another and hold so-called LAN parties where groups plug into a network and do battle. In 1996, id Software started an annual competition that attracted 150 players. Last year, some 5,000 players showed up.

Now, mainstream retailers are getting in on the action. Japan's [Nintendo Co.](#) hosts online chats with its game developers in addition to allowing customers to post reviews of its games.

After it noticed kids were tuning their radio-controlled cars with custom wheels, suspensions and running lights, [RadioShack Corp.](#) hosted a radio-car Web site and sponsored a national racing competition around its

Xmods cars last summer. Its Web site is a gathering place for owners to swap tips on customizing and racing cars. Enthusiasts also use the site to recruit for racing clubs.

Sony holds Aibo days almost once a month at its retail stores, allowing owners of its Aibo robotic dog to gather and show off their training skills.

10. The New Home Computer

Laptop PCs, once prized largely by business travelers and well-to-do college students, are becoming the preferred home computer. Their built-in wireless networking and entertainment flourishes, such as wide-screen displays, have edged out desktops in most home PC sales.

NPD Group, which tracks retail sales, says laptop PCs were the second-largest sellers among consumer electronics -- after projection TVs -- during last year's Thanksgiving week.

Notebooks now rival TVs, with wide-screen displays that give a big-screen look to DVD movies. In the past year, wide-screen displays have become the dominant type for home and business notebooks. What's more, built-in wireless networks appeal to teens absorbed with instant messaging and gamers who tote their laptops to LAN parties.

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