**NEW WORLD OF NEWS:** A passenger on a train [left] reads a customized version of *The New York Times* in an electronic reader made by iRex.

# E-Newspapers: Digital Deliverance?

## Dozens of major newspapers are experimenting with electronic reading devices

The Swedish mobile technology engineer Stig Nordqvist has a vision. He sees millions of people accessing up-to-the-minute, broadsheet-quality news on small handheld devices that can stay switched on longer than most people can stay awake. Think iPod— plus connectivity—for newshounds.

When? A lot sooner than you might expect. Several newspapers in Europe and Asia are already producing dedicated e-reader editions, and others are following suit. At the forefront are a couple of dozen publications part way through a three-year electronic news initiative, organized by IFRA, a publishing trade association based in Darmstadt, Germany, with more than 3000 members worldwide. IFRA launched its e-News

project in March to help members evaluate business and editorial opportunities opened by a new generation of handheld electronic reading devices [see photo, "New World of News"]. Participants include *The New York Times* and its *International Herald Tribune* subsidiary in Paris, Spain's *El País*, Britain's *Telegraph* Group, and Japan's *Yomiuri Shimbun*.

"We are seeing the start of a big change as to how we read not just newspapers but books and magazines as well," says Nordqvist, IFRA's director of business development. "E-reader technology in the newspaper industry is going to take off, and the evolution of these devices will be breathtakingly rapid."

Nordqvist's view is rapidly gaining ground in the industry, despite the

newspapers into the mobile digital age.

Take the iLiad, an electronic reader developed by iRex Technologies (Interactive Reading Experience), a Dutch company in Eindhoven, launched in July by six engineers who split off, amicably, from Dutch Royal Philips Electronics. At first glance, the iLiad looks like an oversize PDA or an ultrathin tablet PC, but the similarity is only skin-deep. Personal assistants and tablets generally have heavy, backlit LCD screens that chew up battery power, but the iLiad is composed of a plastic sheet embedded with millions of microscopic capsules containing oppositely charged black and white particles. A positive charge applied to the electrodes in the substrate attracts the black particles and pushes the white ones to the top of the microcapsule, where they become visible, and vice versa.

For reading, that kind of active-matrix electrophoretic display—invented by E Ink and used in all the e-readers currently on the market—has three significant advantages. Because the screen, like paper, reflects rather than transmits light, it is equally viewable from any angle, unlike an LCD screen, which is designed to be viewed head-on. It is also readable in direct sunlight, an important selling point.

Another eye-saving feature is the static image. "It is just like paper—there is a zero-refresh rate," explains iRex cofounder Jan van de Kamer.

Because the image does not move, it doesn't drain the battery, which at present holds a charge for 15 hours. The company says the battery will soon allow for 20 hours of uninterrupted reading—enough time to digest Sunday's edition of *The New York Times*.

The iLiad weighs in at 390 grams and has a 20.6-centimeter (8.1-inch) display set inside a 15.5-by-21.6-cm frame that is 16 millimeters thick. Two rivals, the Sony Reader and a device made by the Chinese firm Jinke, in Tianjin, are even lighter, with screens roughly the same size. Resolution on all E Ink–equipped devices is 160 to 170 pixels per square inch, 50 percent denser than LCDs. The iLiad sells for about US $700, the Sony Reader for $300 to $400, and the Jinke reader for less than $200.

For newspaper readers, connectivity will be critical. Depending on the device, content can currently be downloaded to e-readers either through a wired USB port or an Ethernet port, or—with the exception of the Sony Reader—wirelessly via Wi-Fi, Bluetooth, or Edge, the standard for enhanced data transfer in the

discouraging performance in the last decade of the obvious precursor technology, e-books.

Bruno Rives, president of Tebaldo, a digital media consulting firm in Paris, predicts that 2007 will be a breakthrough year for e-readers. "The stakes are so high that all of the actors in the sector have accelerated development," says Rives, a leading expert on the commercial applications of electronic paper.
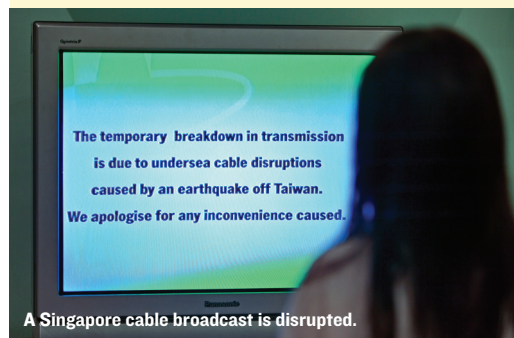
Many newspapers continue to turn handsome profits, but with circulation and ad revenue generally stagnant and more and more readers going to the Internet first to get news in real time, no publisher can ignore the writing on the wall. Bluntly put, there's not much future for the once-a-day distribution of highly perishable information, printed with ink on thin sheets of expensive, chemically treated wood pulp.

Enter half a dozen new e-readers from Europe and Asia, most relying on an electronic ink developed by MIT spin-off E Ink, in Cambridge, Mass. Oddly, none appears to have been designed specifically with newspapers in mind. But people in the black-on-white news business say the devices just might be the vehicle to bring

# NEWS BRIEFS

**GOAL!** The value of flat-panel displays produced in Taiwan during the first 10 months of 2006 exceeded 1 trillion Taiwan dollars (US $31 billion). The value for the whole year is expected to approximate TWD 1.3 trillion, indicating that Taiwan will displace South Korea as the world's top exporter and producer of large flat panels. In 2002, the government initiated a "two-trillion, two-star" program, aiming to achieve TWD 1 trillion production in both the semiconductor and display industries. The semiconductor sector attained that goal in 2004.

**UNDERSEA CABLES DOWN** An earthquake that struck Asia's Luzon Strait on 28 December with a magnitude of 6.7 damaged several telecommunications cables: APCN-2, connecting eight Asian countries; one stretching from South Korea to the Netherlands; and C2C, linking the East Asian countries to the Unites States. Altogether, seven undersea systems accounting for 90 percent of East Asia's telecom traffic were temporarily knocked out. The financial impact was limited, however, because of the holiday season.



The temporary breakdown in transmission is due to undersea cable disruptions caused by an earthquake off Taiwan. We apologise for any inconvenience caused.

**A Singapore cable broadcast is disrupted.**

**CLIMATE SERVICE?** Scientists led by Edward L. Miles, professor of marine studies and public affairs at the University of Washington, in Seattle, have proposed the creation of a U.S. national climate service, to help citizens, businesses, and governments apply knowledge about climate variation and change. They argue that because of advances in understanding climate impacts, the time is ripe for that knowledge to be integrated regionally and nationally to better prepare for climate shifts.

European GSM cellular system. But even that may not be good enough: next-generation devices will probably need to give readers up-to-the-second information via the latest and best mobile wireless protocols like WiMax, Korea's WiBro, or cellular systems.

"There is simply no reason for a newspaper to do an e-reader edition on a device that does not have mobile connectivity," says Philippe Jannet, director for electronic editions at *Les Echos*, the Paris business newspaper that is part of the Pearson group, which includes the *Financial Times*. *Les Echos* will become on 1 March the first in Europe to move beyond a trial phase into a full-fledged e-reader service.

Mobile wireless connectivity is not the only feature that is essential to the e-newspaper's success, of course. In the long run, most people will want color dis-

*Les Echos* will not be the first newspaper to launch a full-fledged e-reader edition. *The Yantai Daily,* in China's Shandong Province, broke that barrier in October, offering a personalized news feed on iLiad readers. The newspaper bought 2000 of the devices because it concluded that "iRex is the most sophisticated e-paper provider in the world," project manager Li Qingji told *IEEE Spectrum*, speaking by phone.

Van de Kamer of iRex, obviously delighted, says there are a half-dozen other Chinese publications that are considering or have already decided to launch e-reader editions, including the *Ningbo Daily* and the *Jiefang Daily*, a Shanghai newspaper. "People are amazed that we are shipping into China. Usually it is the other way around," he says.

Still, not everyone is as confident as Nordqvist or van de Kamer that e-paper readers are the future for newspapers, and

employee of AFP.] "You can do work on a PC tablet, which makes it more likely that your company will pay for it," LeMeur says. "That's not true of an e-reader."

E-reader business models, at this early stage of development, pretty much run the gamut but generally can be classified as either closed or open. Sony, for example, has adopted a closed "iTunes for e-paper" approach, offering proprietary content—mainly books—that can be accessed only from its Sony Connect Web site.

An alternative "kiosk" approach, emerging in Europe, allows a publisher or packager to offer a device that not only contains a regularly updated edition of one particular publication but also the possibility to subscribe to others. Major newspapers in Sweden, for example, will soon announce their simultaneous launch of e-reader editions, so that once you have the device, you can subscribe to any of their services, Nordqvist says.

The maker of the iLiad, iRex, already provides what amounts to a hosting service on its servers for newspapers, acting as an interface between publisher and consumer, and Amazon is said to be planning a similar service (though it did not respond to a request for comment).

The only sure thing about the future of e-newspapers is that the readers, editorial content, and business ideas will keep evolving quickly. "I am almost sure that within six months, e-reader technology will change—it will no longer be E Ink," Telbado's Rives said at an ePaper conference he organized in Paris in December. While there are about a dozen makers of ePaper worldwide, Rives is betting that a company called Bridgestone Corp., in Tokyo, will ultimately prevail because its passive-matrix technology is less expensive to manufacture and refreshes more quickly when "turning" pages.

Bridgestone's Quick Response Liquid Powder Display, unveiled last June, can be as thin as 0.29 millimeters, enables two colors, and—combined with a plastic substrate—can be bent. Bridgestone is exploring commercial applications with Hitachi.

The business environment makes it risky to make bold moves now but riskier still to sit on the sidelines doing nothing. "Maybe these devices will never take off," says Meredith Artley, digital development director of the *International Herald Tribune*, "but then again, maybe they will do everything.

"We are trying to stay ahead of the curve—but not too far ahead."

—**MARLOWE HOOD**

> ## Bluntly put, there's not much of a future for the once-a-day distribution of highly perishable information, printed with ink on thin sheets of expensive, chemically treated wood pulp

plays, for example, but that's at least still a couple of years off, van de Kamer says. Absence of color may be one reason that business publications have been among the first to test the e-reader waters.

Jannet is sold on the concept, though not on the iLiad prototype *Les Echos* tested early last year—which he said turned out to be too slow and too small. Rather than wait for the technology to improve, Jannet asked Rives of Tebaldo to design a streamlined device according to his specifications. The newspaper is selling the device, made by the French company Ganaxa, based in Paris, for about $200, and starting next month, it will offer to give units free to the first 1000 subscribers. The iLiad, meanwhile, has improved so much that Jannet has decided to offer it as a high-end option.

Giving away a $200 device to get a subscription may sound like a high price to pay, but consider a newspaper's potential savings. Newsprint accounts for at least 20 percent of production costs at most newspapers, according to the North American Newsprint Producers Association, in Quebec, while distribution accounts for 5 to 10 percent. Russell Wilcox, the chief executive of E Ink, estimates that the average newspaper spends just $150 per year per reader in production and distribution costs.

not every trial has been a thundering success. Last spring, in a three-month trial with 500 readers, the Belgian business daily *De Tijd* essentially copied the print edition onto the e-reader once a day, with no updates between editions, no redesign for the new platform, and no additional content provided.

"We have decided not to go further," is all that *De Tijd*'s project manager, Peter Bruynseels, would say by phone.

Bill Gates, for one, seems to be betting that streamlined tablet PCs will overpower e-readers in the competition for mobile news consumers. Microsoft recently developed a scalable, fit-to-screen edition of *The New York Times* that works on platforms ranging from small PDAs to king-size graphics monitors, and will use only Microsoft's Windows or Vista operating systems. Called the Times Reader, it is currently available in a beta version.

One advantage of the PC tablet approach, notes Laurent LeMeur of Agence France-Presse, is that the cost of acquiring e-readers is more easily shifted to the subscriber's employer. As director of AFP's R&D Medialab in Paris, LeMeur mediates between the company's technical and editorial divisions and monitors market trends in the news industry. [Disclosure: the author of this article is an